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JANUARY, 1959

Construction Methods

AND
EQUIPMENT

ALAN C. GRIFFIN, PUBLISHER

Day and night blasting,
loading, and hauling of
rock from benched-in cliff-
side throughout winter
maintains tight work
schedule on \$98-million
Niagara Generating Plant
at Niagara Falls, N. Y.

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USER SATISFACTION

FAITHFUL "EMPLOYEE" FOR 35 YEARS



Yellow Strand stands the test of time at E. T. Slider Company, Inc.

Thirty-five years ago, E. T. Slider Company, Inc., Louisville, Kentucky, selected Broderick & Bascom Wire Rope for their dredge and winch operations. It's still top choice today! After these many years of experience, here's what they have to say: "We can say that B & B is the best rope ever made. It is reliable, economical and when properly used, gives you years and years of best service."

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CLIPS

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Smileage!

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Job Finished 3 Weeks

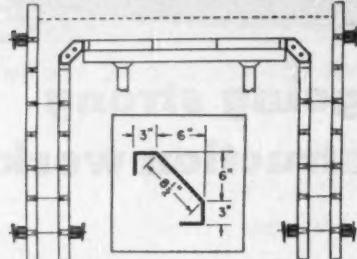


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Construction Methods AND Equipment

JANUARY, 1959

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Robert K. Tomlin was appointed editor of CONSTRUCTION METHODS in January 1928, was succeeded by Waldo G. Bowman in January 1946, by Harold W. Richardson in February 1949, and by Henry T. Perez in June 1954.

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Lay

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Tolerances

Lubrication

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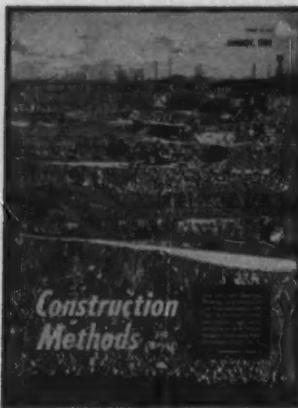
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MACWHYTE WIRE ROPE

Wire Rope made for a purpose — to serve you better



JANUARY, 1959

Pay Dirt in This Issue

ON THE COVER

Rock excavation for the foundations of the \$98-million Niagara Generating Plant near Niagara Falls, N.Y., goes ahead at a rate of between 30,000 and 40,000 yd a day. Merritt-Chapman & Scott Corp. works a big equipment fleet around the clock on a series of benches cut into the face of the cliff to maintain this production rate. See story beginning on page 58.

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NEXT MONTH

The longest freeway job California has ever awarded in one contract also is an outstanding example of how an alert contractor can hold down his costs. Fredericksen & Kasler of Sacramento bid \$5.8 million for the job, nearly \$1 million lower than the second low bidder, then set to work to show that they could do the job at that price.

Precast Units Form

Dome of Power Plant

Precast sections that weigh altogether about 7,000 tons fit together to form a self-supporting dome on top of the 180-ft-dia concrete cylinder that houses an atomic reactor.



Small Barges

Float Big Drill Rig

Six small interlocking barges form a Y-shaped unit on which a contractor mounts equipment to drill foundation shafts for piers of a bridge over the Red River at Denison, Tex.



Airfield Builders Push

Four AFB Jobs in Michigan ..

Four similar contracts—they all run about \$9 million—to enlarge existing Air Forces Bases in Michigan provide an opportunity to compare the methods of the contractors.



Big Fleet Carves Stairway in Cliffside

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YOU BE THE JUDGE

Put a Gorman-Rupp Diaphragm Pump on your job . . . alongside any other make, size for size. If it doesn't prove to be the best all around pump, return the Gorman-Rupp.

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Gorman-Rupp 4" diaphragm pump with electric motor.



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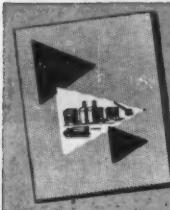
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WORLD'S HIGHWAY BATCHING RECORD!

IN ONE DAY 6,029 LINEAL FEET

This is a record announced by the Michigan State Highway Department on behalf of Denton Construction Company

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x 9 inches (thickness)
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- Cubic yards. 4,019
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- Number of batching plants. One BUTLER TX-4
- Site. U. S. 23 near
Dundee, Michigan
- Contractor. **DENTON
CONSTRUCTION
COMPANY**



Do you want to know more about the BUTLER TX-4 and its versatility in production? Just write "TX-4" on a postcard with your name and address. We'll rush complete details immediately.

Notice that 3 pavers were used. The BUTLER TX-4 can readily satisfy 4 dual drums. What would the record be if 4 pavers had been on that job?

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REAL ROCK
SHOVEL**

NORTHWEST

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**"151,000 MILES WITHOUT
A MAJOR OVERHAUL!"**

*says Clarence F. Guthrie
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Yes, the new '59 Ford trucks are here to take you *Ford-ward* for savings, *Ford-ward* for modern style and stamina.

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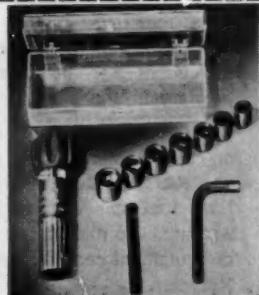
LESS TO OWN...LESS TO RUN...LAST LONGER, TOO!

YOURS FREE!

It's our get-acquainted gift for those who plan to buy a truck during 1959.

Compact, "pocket-size" kit contains seven different size sockets with straight shank for normal use—"elbow" shank for offset work in hard-to-reach areas. Transparent plastic case provides handy storage at home, in the truck, etc.

**VERSATOOL
SOCKET
WRENCH KIT**



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WINTERTIME

... and the starting is rugged!

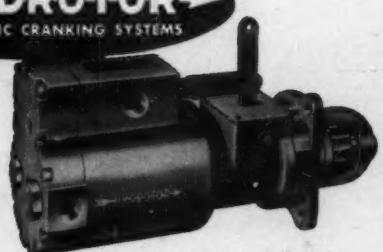
Expensive, too. When freezing weather strikes, countless man hours, machine hours and profits may be squandered before your equipment gets going.

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AMERICAN BOSCH ARMA CORPORATION

Construction News From Washington

Washington, D.C.
January, 1959

Finding \$1 Billion for Roads

An unpleasant task facing the new 86th Congress is the necessity for raising about \$1 billion more this year for the Highway Trust Fund. Congress will grumble, but it will raise the money. The alternative is to fall far behind the roadbuilding schedule set up in the National Highway Act.

In the end, it's a good bet that the 86th will fall back on the old, reliable federal gasoline tax—raising it a penny to 4 cents a gallon. In the 12-month period ending last September, the 3-cent gasoline tax produced \$1.6 billion of the \$2 billion that went into the trust fund.

Some Congressmen are talking about raising more trust fund revenue by diverting to it other highway user tax receipts—such as the tax on lube oil, excises on automobiles, etc—that now go into general treasury funds. But the Administration probably can block this; the overall budget situation is such that it certainly will make a strong fight to prevent any "raid" on general revenues.

Changes in Taft-Hartley?

Among others, the Building Trades Unions would like to see the Taft-Hartley Act opened up for some major revisions in the new year. Their own pet objectives: to permit hiring hall operations on construction jobs where union and contractors sign work agreements before work on a project actually begins, and to allow union shop elections on construction jobs after seven days instead of 30 as Taft-Hartley now specifies.

But chances are quite dim for a general Taft-Hartley overhaul in the new Congress. The big push this year is for a reform bill—to crack down on mishandling of union funds, to put officers under more discipline, to give the rank and file more voice in union affairs. And Congress is in no mood to tackle more than one big labor bill in 1959.

Tug-of-War on Military Construction

Congress and the Administration are set to do a little head-knocking on how much money should be spent in the coming fiscal year for military construction. In this fiscal year, ending next June, the outlay will be something like \$2 billion; in the coming fiscal year, the Administration would like to hold it to around \$1.7 billion.

From the figures at hand, two Administration decisions are apparent: the Pentagon is ready to end the Strategic Air Command's base dispersal program during the next 18 months. And it has decided to keep missile base construction at roughly the present rate.

But Congress is not likely to accept these decisions. In 1958,

Construction News from Washington . . . continued

Congress raised the military construction budget. You can count on a repeat performance in 1959. So this is the prospect: Congress will vote as much as, if not more than, in 1958, and the Administration will spend what it pleases—meaning less than is voted.

The Future for Taxes

In past years, a popular political pastime in Washington at this season has been to talk up the possibilities of a tax cut—no matter whether there was, in fact, any serious thought about enacting such legislation. Not so this year. Tax talk, such of it as exists, is on the other side—about the need for more revenue.

As of now, there's little serious talk about raising basic tax rates. There is a lot of responsible talk, however, about the need to raise additional revenue. This probably points toward some sort of revision, by 1960, at least, that will reduce the benefits of taxpayers who now get special treatment under the law. Any revision will have more revenue, not less, as its goal.

Specifically, you can look for the 52% corporate income tax rate to be continued beyond its June 30 expiration date. The same is true for the so-called Korean excise rates on cigarettes, liquor, and a number of other items.

The kinds of income entitled to capital gains may be limited.

Taxation of farmer coops may be subject to some technical legislation, but the kind of treatment coop critics want won't be passed.

The special 27.5% depletion allowance for oil producers will be under heavier attack this year, but the odds are against any reduction.

Asphalt Wins a Fight

Asphalt paving contractors will soon be bidding again on a major part of the runway construction at Air Force bases. The Air Force has agreed to modify its two-year-old ban against flexible pavement. Asphalt may now compete for about 75% of Air Force runway paving work.

A test, conducted by Army Engineers for the Air Force at Columbus (Miss.) Air Force Base, is responsible for the Air Force's change of mind. Results of the test impressed members of a House Armed Forces subcommittee.

In its final report on the long-fought issue, the subcommittee urged prompt action to restore asphalt competition. The Air Force agreed. Now the asphalt industry hopes to see early results in greatly increased use of flexible pavement by the Air Force.

How big the reopened market may be is indicated by Air Force pavement awards since August, 1957. In the 16 months since then, the Air Force has awarded 1,300,000 sq yd of new pavement and nearly 2,600,000 sq yd of runway extensions, widenings, and the like. Portland cement concrete took 90% of the new pavement and 77% of the supplemental paving put out to contract in this period.

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Goodyear. This is the rim that has been adopted by the Tire and Rim Industry for tubeless replacement of all conventional tire sizes 12:00 and larger.

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If you have a rim problem, talk it over with the G.R.E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.



New Tru-Seal Rims — for sizes 12:00 and up, including all earthmover and grader sizes. This rim is similar to multiple-piece rims now in use — PLUS airtight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted.

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GOOD YEAR

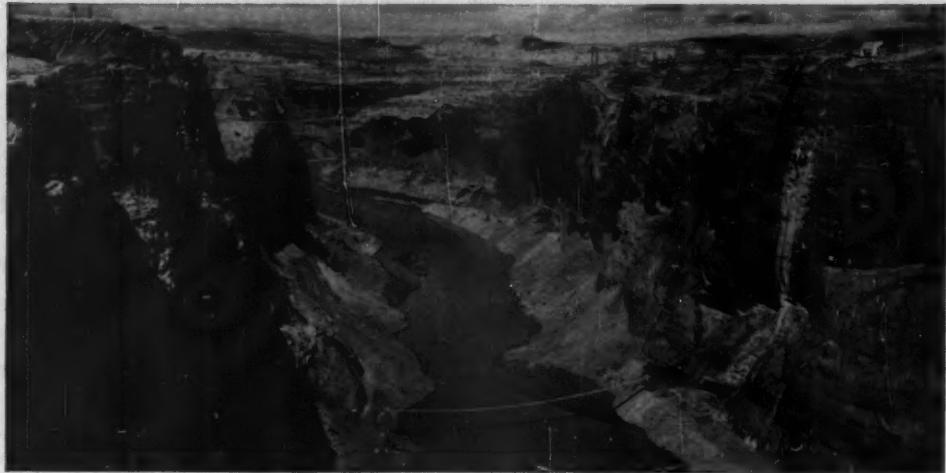
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*More tons are carried
on Goodyear Rims
than on any other kind*

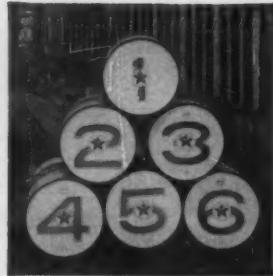
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SECOND LARGEST DAM IN THE U. S., at Glen Canyon, Ariz., will incorporate two of these 2,800 ft. diversion tunnels. Frazier-Davis equipment runs dependably, stays on the job, thanks to the Texaco Simplified Lubrication Plan.



Glen Canyon tunnel borings nearing completion with Texaco Plan



Only 6 lubes needed to keep
Frazier-Davis equipment
working dependably

This is Frazier-Davis Construction Company's job: to bore the east side diversion and service tunnels, with a combined length of 2½ miles, through the walls of Arizona's Glen Canyon. It's a vital project, part of the Bureau of Reclamation's \$760 million development of 10,000 square miles of arid land. On a job as big as the Glen Canyon Dam, on-time completion of every phase is absolutely essential. And that puts a priority on dependable equipment performance.

The Texaco Plan keeps equipment on the job—at lowest cost—by handling all major lubricating problems with no more than six products. A combination of specialized and multi-purpose lubricants assures proper lubrication for each machine, with lower lubricant inventory and less

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Here are the lubricants Texaco recommended for Frazier-Davis:

Texaco Ursa Oil Heavy Duty—keeps engines clean, rings free, valves properly seated for full power.

Texaco Regal Oil R&O—prevents formation of rust and harmful deposits in compressor systems.

Texaco Universal Gear Lubricant EP—keeps differentials and transmissions running smoothly at low cost.

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Bureau of Reclamation photos

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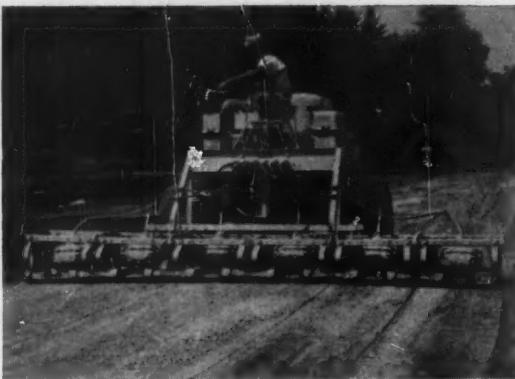


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WITH *ANY PRIME MOVER



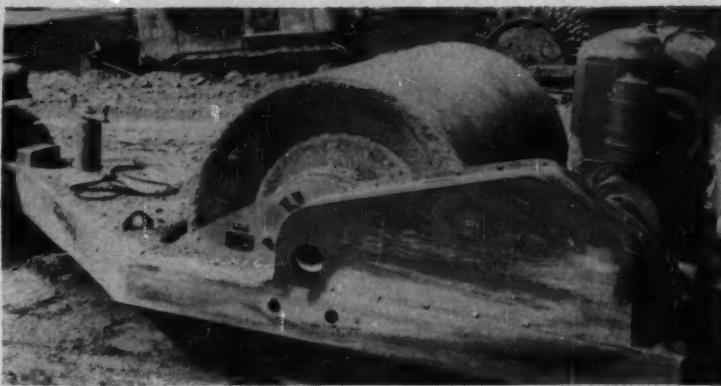
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For the host of contractors acquainted with the outstanding performance of the Jackson Multiple Vibratory Compactor, the advent of the new TRAILER COMPACTOR will be great news. For here is a machine basically similar, costing considerably less, that can be PUSHED or PULLED BY *ANY PRIME MOVER CAPABLE OF SLOW (50 f.p.m.) WORKING SPEEDS . . . TOWED TO LOCATION AT ANY ROAD SPEED . . . OPERATED IN EITHER DIRECTION, NO TURNING OR BACKING NECESSARY . . . REMOTELY CONTROLLED BY OPERATOR OF PRIME MOVER. WORKHEAD MAY CONSIST OF 3, 4, 5, or 6 VIBRATORY UNITS, (each developing 6,000 lbs. of force at 4200 RPM) OR TWO WORKHEADS OF 4 UNITS EACH MAY BE EMPLOYED. INDIVIDUAL UNITS MAY BE DETACHED AND OPERATED SEPARATELY. POWER PLANT SUPPLIES BOTH SINGLE AND 3-PHASE 110-150 VOLT, 60-80 CYCLE AC AND HAS MANY USES.

Write, wire or phone for additional information.

JACKSON VIBRATORS, INC. LUDINGTON, MICH., U.S.A.

Job Talk...



Vibratory Roller Cuts Compaction Costs

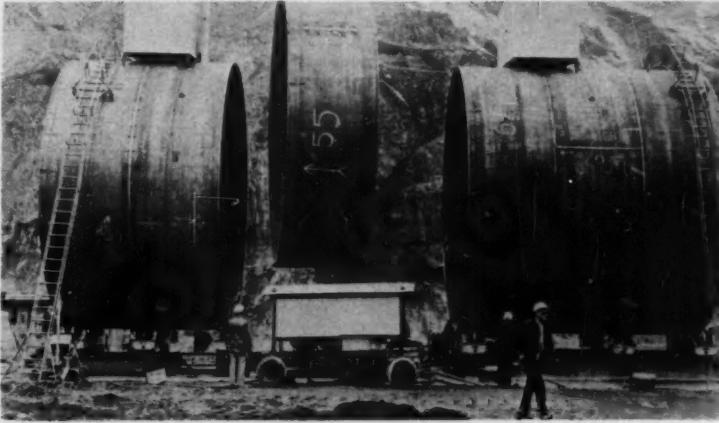
Compaction of fill material for a \$7.2-million interchange linking the Golden Gate State and San Bernardino freeways in Los Angeles gave Vinnell Constructors a lot of trouble until they tried a combination of sheepsfoot and vibratory rollers.

The 1,000,000 yd of fill required for the job comes from a cut area that was once a city dump. Spongy organic material is mixed in with the oil shale, and moisture content is 10-15% above optimum.

Sheepsfoot rollers alone attained only 88% density on the fill even after 10-12 passes. Vinnell reduced compaction time by

half by bringing in one of the new Essick vibratory rollers. After four or five preliminary passes with the sheepsfoot to break up the larger chunks of shale, the Essick roller brought final density up to 94% in only two or three additional passes.

The new Essick is the biggest vibratory roller available. It has a 72-in.-wide roller that delivers 2,320 vibrations per minute. The machine hits a 30,000-lb blow per vibration, developing 580 tons of kinetic energy per second. Powered by a 59-hp engine, the Essick VR-72T can be pulled by a tractor as small as the John Deere 420.



Welding Rigs Fabricate Penstock Liner

Arc welding machines on wheeled carriages are completing 26,000 ft of welded seams in the penstock liners that Morrison-Knudsen Co. is installing at Brownlee Dam.

The job involves construction of four 520-ft-long penstocks lined with 24-ft-dia prefabricated steel cylinders. Eight 7½-ft

continued on page 20



STEEL-SHEET PILING

get the exact job lengths
and exact job sections
on the Foster Rental Plan

To get real help on your piling work, and for the fastest dependable service, count on the Foster Rental Plan to save you money. It's the one sure way to get the exact sections and the exact lengths of Steel-Sheet Piling to meet your job requirements. Your only cost is a low, fixed expense chargeable to work in progress . . . no need to tie up capital in inventory.

We'll deliver your complete piling needs immediately, anywhere in the country, from our nationwide warehouse and field stocks—"Faster-from-Foster".

For help in ordering,
write or call the Foster
office nearest you for
free Piling Wall Chart
No. CM-1.

SINCE 1901



COMPLETE CONTRACTOR SERVICE

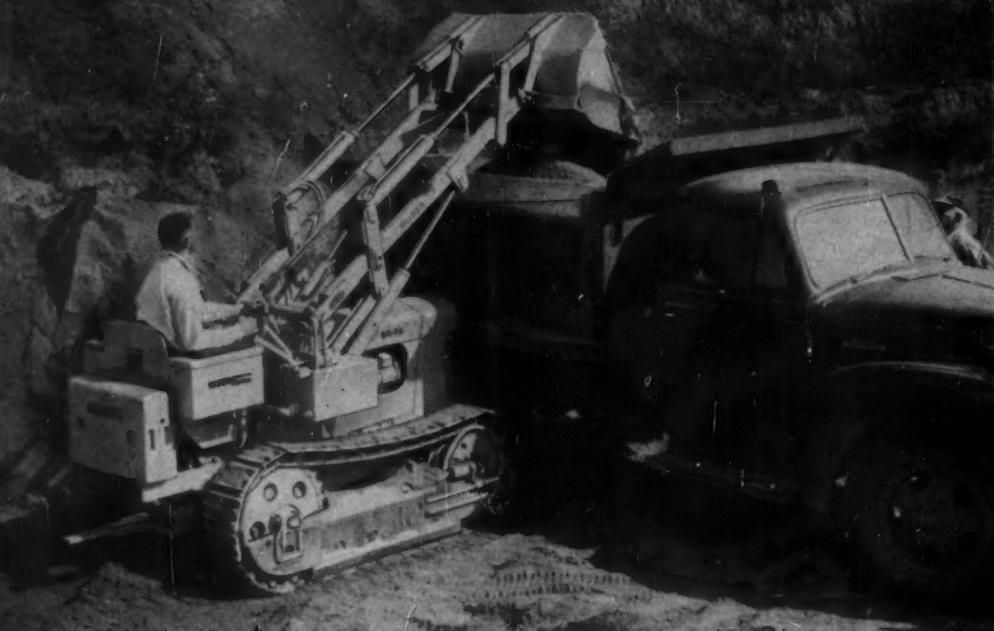
PILING • PIPE • RAIL • HIGHWAY PRODUCTS

LB FOSTER CO.

PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

OLIVER OC-4

The popular "prime" mover that's perfectly sized for hundreds of major and cleanup jobs which rule out larger crawlers as poor economics. Ideal for confined-area operation, the OC-4 with "Spot-Turn" steering has the shortest turning radius of any crawler produced. Completely versatile, it works with loader, backhoe, dozers, scarifier, winch and other job-extending attachments. What's more, only the OC-4 in the 30 h.p. class gives you the choice of gas or diesel power, plus a selection of either "Travel-Reverser" or "Slo-Low" auxiliary transmissions. $\frac{1}{6}$ yd. loader.



Now...

OLIVER

OLIVER OC-12

A production crawler that hastens the pace on any job you give it. Powered with a high-torque gasoline or diesel engine built for tractor service, the OC-12 is the full-featured crawler in the popular 50-60 h.p. range. It will shoulder the load of the toughest work schedules and bring you through with extra earnings with its easy, time-saving "Spot-Turn" steering...rugged track frame and free-turning track rollers for smooth, friction-reducing action...heaviest duty frame and final drive construction...high-clearance design. Also rapid-cycle OC-126 $1\frac{1}{2}$ -yd. loader model.



TRY BEFORE YOU BUY...

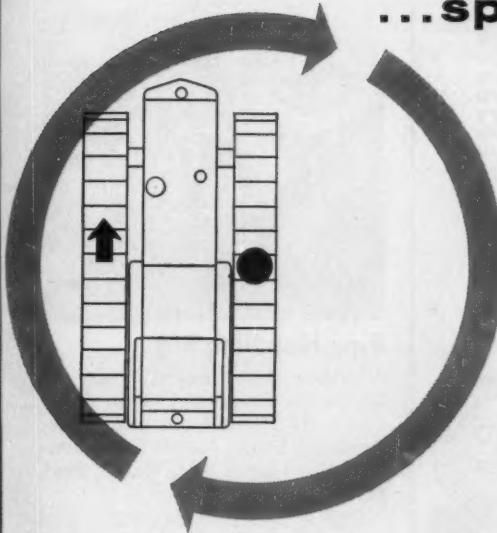


OLIVER OC-15

The greatest power-to-weight ratio ever offered in any crawler in the 110 h.p. class! A tremendous producer in all dozer and angleblade work, the OC-15 has the built-in stamina to make it first for continuous service in the hardest, dirtiest jobs you can give it... and last in upkeep because of its heavy-duty, service-saving design, reinforced and trussed at every stress point. Long 87½-inch track has proper ground contact to give high-flotation and tremendous traction to utilize the great reserve of power. Available also as OC-156 2½-yd. "unitized" loader model.

"SPOT-TURN" clutch steering

eliminates foot braking on turns
...speeds operation, cuts costs!



New Oliver "Spot-Turn" clutch steering gives you the finest combination of maneuverability, operating ease and safety you have ever seen in a crawler tractor.

With "Spot-Turn" clutch steering you get locked-track, right-about faces or gradual turns merely by simple, single-lever control. No effort-expending foot braking is called for—pull the lever and automatic braking is delivered instantly. Pull both levers and the tractor stops in its tracks instantly!

"Spot-Turn" is tops for simple tractor operation. Steering is always the same—uphill, downhill, pushing or pulling, with load and without—cross steering is completely eliminated. By being able to feather your turns, you have perfect control no matter what the terrain.

What could be simpler and safer in crawler tractor operation—or contribute more to increased tractor earning power?



THE OLIVER CORPORATION

The Oliver Corporation, Industrial Div.,
19300 Euclid Ave., Cleveland 17, Ohio.

YOU'LL WANT A NEW OLIVER!

FOR LOWER TON-MILE COSTS



Replace with **DEPENDABLE** **CONTINENTAL** **RED SEAL** **POWER**

In highway hauling, as elsewhere, profit margins continue to shrink, and wise choice of rolling stock becomes more essential than ever. That is why more and more truckers are replacing original equipment engines with rugged Continentals, engineered expressly for the job. Choose from the models listed below. See your distributor today.

RED SEAL TRANSPORTATION ENGINES

GASOLINE

Model	Cyl.	Displ.	Bore Engine H.P.
M4062	4	62	26.3 @ 3500 RPM
Y4069	4	69	28.0 @ 3400 RPM
Y4091	4	91	36.0 @ 3400 RPM
F4124	4	124	47.0 @ 3200 RPM
F4140	4	140	52.0 @ 3200 RPM
F4162	4	162	58.0 @ 3200 RPM
F6186	6	185	77.0 @ 3500 RPM
F6209	6	209	90.0 @ 3500 RPM
F6226	6	226	98.8 @ 3500 RPM
F6244	6	244	103.3 @ 3500 RPM
M6271	6	271	96.5 @ 3000 RPM
M6290	6	290	108.0 @ 3000 RPM
M6330	6	330	125.0 @ 3000 RPM
M6363	6	363	146.0 @ 3000 RPM
B6371	6	371	123.5 @ 3000 RPM
B6427	6	427	142.0 @ 3000 RPM
F65226	6	226	126.2 @ 3400 RPM
K6271	6	271	114.5 @ 3200 RPM
K6290	6	290	123.0 @ 3200 RPM

Model

Model	Cyl.	Displ.	Bore Engine H.P.
K6330	6	330	147.0 @ 3200 RPM
K6363	6	363	162.0 @ 3200 RPM
T6371	6	371	143.8 @ 3000 RPM
T6427	6	427	170.0 @ 3000 RPM
U6501	6	501	186.0 @ 2600 RPM
R6513	6	513	192.2 @ 2800 RPM
R6572	6	572	220.0 @ 2800 RPM
R6602	6	602	232.0 @ 2800 RPM
S6749	6	749	250.0 @ 2800 RPM
S6820	6	820	300.0 @ 2800 RPM
V8603	8	603	260.0 @ 3200 RPM

CUSHIONED POWER DIESEL

Model	Cyl.	Displ.	Bore Engine H.P.
TD6427	6	427	146.5 @ 2600 RPM
RD6572	6	572	172.0 @ 2400 RPM
VD8603	8	603	200.0 @ 2800 RPM
SD6802	6	802	225.0 @ 2200 RPM

PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation

MUSKEGON • MICHIGAN

8 EAST 45TH ST., NEW YORK 17, NEW YORK • 3817 S. SANTA FE AVE., LOS ANGELES 54, CALIF.
6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 1252 OAKLEIGH DR., EAST POINT (ATLANTA) GA.



JOB TALK . . .
continued from page 17

spidered cans, made up of three curved plates varying in thickness from $\frac{3}{4}$ in. at the top to 1-5/16 in. at the bottom, compose each of the 60-ft sections.

To assemble the sections, M-K places them on turning rolls consisting of two powered and eight idler rollers. The Lincoln Electric LAF-3 submerged arc welding heads that weld the seams are mounted on wheeled carriages. Speed of the welder carriage and the rollers that rotate the sections is synchronized so that the welder completes a full girth seam without moving from its station. For outside passes, the welder is mounted within a shelter on top of the sections; for the inside seams it's stationed inside the cylindrical sections.

A level on the welder control box helps the operator keep the unit on center during welding. In addition, a guide wheel rides in the groove to keep the welder on the seam. For the final passes, a Skippy light serves the same purpose.

Two parallel 750-amp motor generators supply current to the welders. Current requirements for the different passes vary from 750 to 1,150 amps. The number of passes required to fill the 60 deg angle at the joint varies from three for the $\frac{3}{4}$ -in. plate to five for the 1-5/16-in. plate.



Pipe Handling Rig

A short, three-legged boom attached to the bucket of an Allis-Chalmers HD-6 front end loader comes in handy for McHone Construction Co., of Fort Worth, Tex., in laying pipe.

Three sections of 2-in. pipe make up the legs of the boom. A single bolt connects each leg to the bucket. The boom can be detached in a matter of moments when McHone needs the tractor for earthmoving work.

Easier Placeability . . .

Earlier Stripping of Forms . . .

Better Finishing . . . with

In the construction of this large, modern suburban department store, again were demonstrated the improved quality and cost benefits obtained with POZZOLITH.

Besides economically providing easier placeability and better finishing, POZZOLITH was an aid in obtaining high early strengths, which permitted earlier stripping of forms to speed completion of the project.

Call in any one of our more than 100 full-time field technical men to discuss these and other benefits of POZZOLITH for your project.

*POZZOLITH . . . registered trademark of The Master Builders Company for its water-reducing, air-entraining admixture for concrete.

POZZOLITH®



"May's-on-the-Heights"—Suburban
Department Store, Cleveland, Ohio
Architect: Victor Gruan Associates,
Detroit, Michigan
Associate Architect: Jack Alan Bialosky,
Cleveland
General Contractor: Sam W. Emerson
Company, Cleveland



THE MASTER BUILDERS COMPANY
DIVISION OF AMERICAN-MARIETTA CO.

General Offices: Cleveland 3, Ohio • Toronto 9, Ontario • Export: New York 17, N. Y.
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SUPERIOR CONTINUOUS THREADED COIL RODS . . .

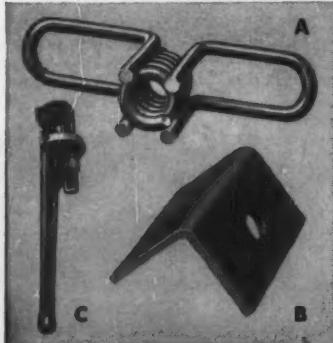


Superior Continuous Threaded Coil Rods, with or without Coil Wing Nuts and Corner Brackets, are a valuable supplement to Superior Coil Ties and standard working parts when job conditions are unusual or difficult.

In three typical applications, shown at the right, these Continuous Threaded Rods are used; (1) to tie form corners; (2) as an anchor rod tie down and as coil bolts; and (3) as a coupling for two coil ties providing an adjustable form tie.

Available in $\frac{1}{2}$ ", $\frac{3}{4}$ ", and 1" diameters and in any length up to 10 ft., Superior Continuous Threaded Coil Rods in quantities can be cut to length on the job with a heavy-duty hand Coil Rod Cutter.

Superior Continuous Threaded Coil Rods are the answer to unusual or difficult tying problems. When you use Superior you are assured of the best in design, material, and workmanship.



A-COIL WING NUTS

Coarse helix coils form the threads. Easily applied and removed from rod. Develops maximum capacity of rods.

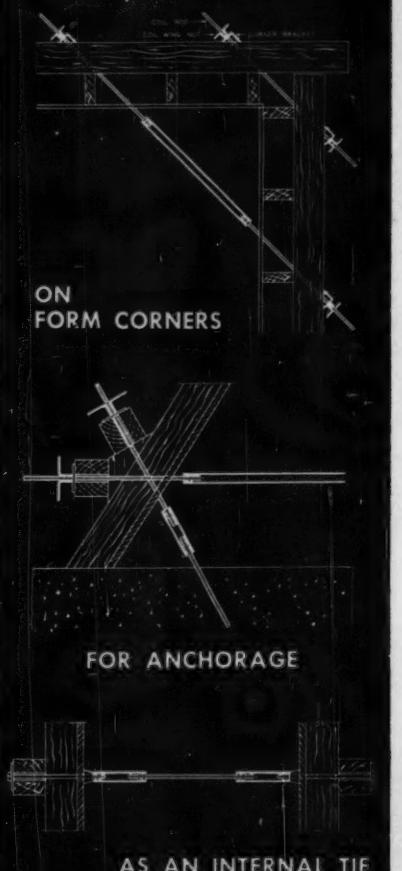
B-CORNER BRACKET

An exclusive Superior feature. Provides simple, efficient method of tying form corners and bulkheads.

C-SPECIAL COIL ROD WRENCH

Heavy-duty Stillson type wrench with special jaws for gripping and turning Coil Rods with least damage to threads.

.... MAKES
DIFFICULT
TYING JOBS
Easy . . .



SUPERIOR CONCRETE ACCESSORIES, INC.

9301 King St., Franklin Park, Ill. (A Suburb of Chicago)

New York Office:
1775 Broadway, New York 19

Pacific Coast Plant:
2100 Williams St., San Leandro, Calif.

NOW AVAILABLE . . . LATEST
EDITION OF CATALOG 600.
Contains a valuable table for
spacing studs, wales, and form
ties. REQUEST A COPY TODAY.

"D-14 ties in perfect with our big rigs!"

—Lloyd Ketchum, Ketchum Excavating,
Lansing, Michigan



Lloyd Ketchum knows how to match his equipment! He has a $\frac{3}{4}$ -yard crawler backhoe, an Allis-Chalmers HD-6 dozer, and an Allis-Chalmers D-14 utility tractor with backhoe and loader.

"We can get into places with the D-14 that we can't go with the bigger rigs. On sewer stub work we get the jobs done just as fast and don't tear up

the lawns. The D-14 has widened our whole work range," Mr. Ketchum said, "by letting us do *more* of every job, and go after more types of jobs."

Mr. Ketchum has owned other makes of utility tractors. He knows the difference between Allis-Chalmers and others. Look at the design of the D-14 and D-17. Try out their ease of handling. You will readily see the difference, too.

They've got the power, speed, weight and maneuverability to work right alongside the big rigs, or step out and do smaller jobs on their own! Try one on your own job. Your dealer will arrange it, or you can write direct to Allis-Chalmers. Use the coupon below, and remember, *it doesn't cost to find out!*

IT DOESN'T COST TO FIND OUT!

ALLIS-CHALMERS

D-14 43-hp, 4,200-lb weight

D-17 63-hp, 5,300-lb weight

SOLD BY ALLIS-CHALMERS DEALERS EVERYWHERE

ALLIS-CHALMERS MFG. CO.

Utility Tractors and Equipment
Milwaukee 1, Wisconsin

Gentlemen:

Show me more about the new design Allis-Chalmers utility tractors and equipment.

I'd like Literature A Salesman's Call
 A Job Demonstration

Name _____

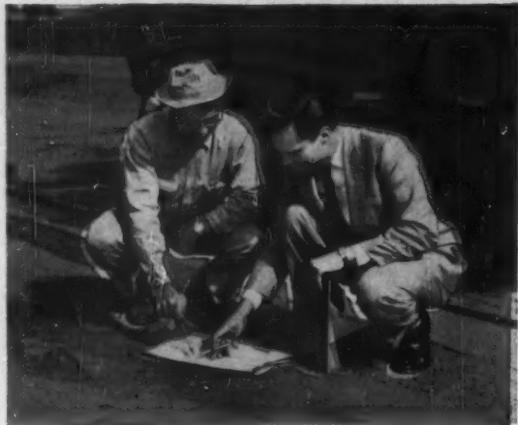
Firm _____

Address _____

City _____ State _____

AB-2

How Standard Oil serves a contractor



This is next. Louis Isabella explains job details to Standard's Jerry Bushman. Isabella's contract covered concrete paving of 26 miles of 24 ft. single lane highway plus interchange connections. When complete, Highway 41 in Wisconsin will be a divided lane freeway.

When N. M. Isabella, Inc. set out to put down 26 miles of pavement on U.S. Highway 41, they met Standard Oil's Jerry Bushman, an experienced automotive lubrication specialist. Jerry was ready right then to provide technical assistance on the job.

The contractor next learned about Standard Oil service when two Standard agents went into action. One agent, they found, was based at Slinger, only three miles away. Another agent was located at Allenton, only five miles from the part of 41 to be paved. These agents set up delivery schedules to the job, and meanwhile, Jerry Bushman arranged for fuel storage and pumping equipment.

Isabella put down 363,000 square yards of paving, averaging 1,600 feet of production daily. They got the job done because they were backed by the kind of service they, and their subcontractors, received from Standard.

What happened when
Isabella Construction
got U.S. Highway 41 paving
job near Milwaukee

Standard has 3,900 agents in the 15 Midwest and Rocky Mountain states ready to serve contractors in the same way these two agents served Isabella. Lubrication technical service comes from qualified, trained men located in Standard's 48 district offices. Get this kind of help on your job. Call the Standard office nearby or write to **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**

Standard Oil Petroleum Products used by N. M. Isabella, Inc.

STANOLUBE S-1 Motor Oil

STANDARD RED CROWN Gasoline

STANOLEX Diesel Fuel

AMOCO Lithium Multi-Purpose Grease

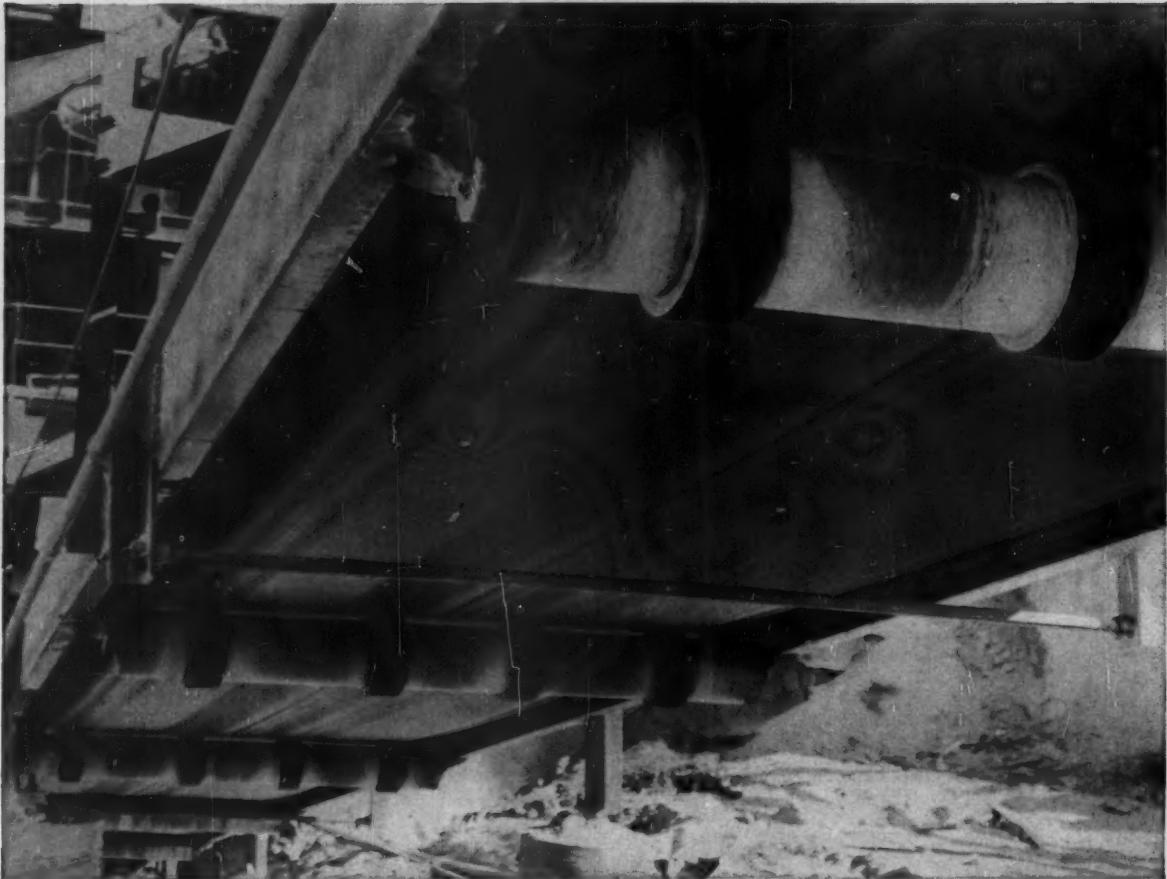
You expect more from  and you get it!



Standard's Jerry Bushman and Don Isabella wind up some lubrication details. Jerry knows the score when it comes to lubrication of construction equipment. He has a science degree from Marquette plus more than four years' experience in this sort of work. He has also completed the Standard Oil Sales Engineering School course.



SEARLE SLEEVES



"U. S." Searle Sleeves help roll up 4,000 tons an hour

To build a causeway, the contractor planned on excavating and placing over a million yards of fill a month by conveyor belt.

Trouble began when mud and sand built up to an almost concrete-hard finish on the return idlers. This accelerated cover wear, caused the belt to wander, also caused excessive belt stress—all of which would result in premature failure. Then a "U. S." Belting Engineer suggested patented U. S. Rubber Searle Sleeves on the return idlers. Over six

hundred of these specially designed rubber sleeves were cemented to the 6"-diameter idlers. Build-up of mud and sand ceased and wandering of belt stopped. The sleeves gave fine performance, needed no maintenance, and moved 4,000 tons an hour.

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Mechanical Goods Division

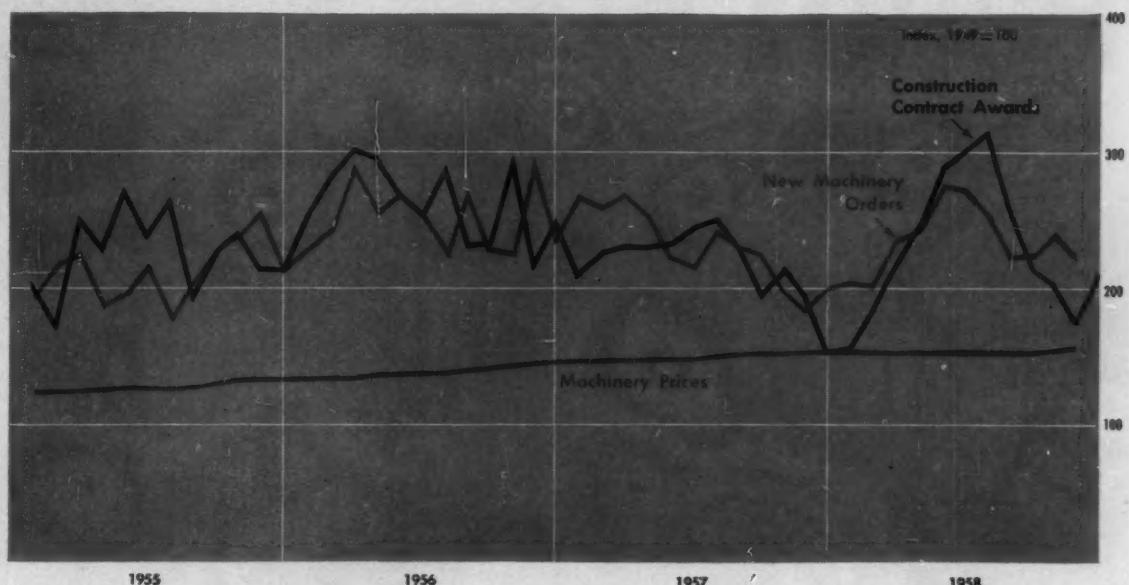
United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y.

In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	NOV	MONTH	YEAR	CHANGE 1957-1958
	1958	AGO	AGO	
All Types of Equipment	167.9	166.8*	165.2	+1.5
Cranes; Draglines, Shovels	166.3	165.8*	163.0	+2.0
Shovel, 1/2 cu yd	156.2	156.2*	153.7	+1.6
Shovel, 3/4 cu yd	170.3	170.3	167.4	+1.7
Shovel, 1-1/2 cu yd	180.7	180.7	174.3	+3.7
Shovel, 2-2 1/2 cu yd	156.6	156.6	154.4	+1.4
Shovel, 3-3 1/2 cu yd	162.7	162.7	162.7	0
Shovel, 6 cu yd	184.1	184.1	179.5	+2.6
Crane, truck mounted	168.1	164.2	164.2	+2.4
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	152.7	152.7	152.7	0
Bucket, dragline	185.0	180.8	180.8	+2.3
Scrapers and Graders	158.8	158.8	158.8	0
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	151.3	151.3	151.3	0
Scraper, 2 Wheel, 14-18 cu yd (a)	122.7	122.7	122.7	0
Grader, heavy duty	164.0	164.0	164.0	0
Grader, light & medium	161.2	161.2	161.2	0
Tractors (non-farm, incl industrial)	183.9	182.2*	180.8	+1.7
Wheel-type, off highway (a)	129.2	129.2	127.7	+1.2
Crawler-type, 45-60 dph	187.6	185.3*	182.6	+2.7
60-80 dph	188.5	188.5	185.8	+1.5
80-120 dph	188.7	186.7	186.7	+1.1
120 and up dph	196.4	191.8	191.8	+2.4
Machinery, Tractor Mounted	165.6	162.1*	161.7	+2.4
Dozer, cable controlled	151.6	151.6	151.6	0
Dozer, hydraulic controlled	180.7	177.3	177.3	+1.9
Cable power control unit	147.9	147.9	147.9	0
Loader, shovel type	161.0	155.1*	153.9	+4.6
Specialized Machinery	150.7	150.7	148.3	+0.9
Ditcher	154.1	154.1	154.1	0
Roller, tandem	193.2	193.2	193.2	0
Roller, 3 wheel	161.6	161.6	161.6	0
Ripper and rotoer	143.3	143.3	143.3	0
Dewatering pump, 10 M gph	111.7	111.7	110.1	+1.5
Dewatering pump, 90 M gph	144.3	144.3	135.6	+6.4
Portable Air Compressors	159.5	159.1	159.1	+0.3
Contractor's Air Tools	164.6	164.6*	184.3	+8.2
Mixer, Pavers, Spreaders	150.1	150.1	148.3	+3.3
Mixer, portable, 11 cu ft	160.1	160.1	155.4	+2.4
Mixer, portable, 16 cu ft	163.7	163.7	159.6	+3.0
Mixer, truck, 6 cu yd	127.3	127.3	122.1	+2.6
Mixer, paving, 34 cu ft	183.9	183.9	174.6	+4.3
Concrete finisher & spreader	181.5	181.5	173.0	+5.3
Bituminous distributor	122.4	122.4	115.9	+5.6
Bituminous spreader	160.3	160.3	160.3	0
Bituminous paver	153.0	153.0	155.3	-1.5
Off-Highway Trucks, Wagons (b)	100.6	100.6*	.....	.....
Contractors off-highway truck (b)	100.6	100.6	.....	.....
Trailer dump wagon (b)	101.4	101.4*	.....	.....

* a January, 1955=100 * b January, 1958=100 * Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Equipment Prices Rise Again in 1958

Nearly all major construction equipment manufacturers have announced price increases during the past four months. This makes 1958 the ninth consecutive year in which price hikes reduced the purchasing power of the contractor's equipment dollar.

On November 15, the Bureau of Labor Statistics index of manufacturers' prices rose to a record high, 68% above the 1947-49 average. Moreover, the November index was 0.7% above October and 1.6% higher than a year ago.

Since 1949, the only year in recent history when prices dipped, manufacturers have raised construction equipment price tags by 55%, according to the BLS index.

Increased productivity of new machines offsets some of the rise in prices. However, the BLS indexes allow much for this design improvement so that the price increase indicated is mainly an erosion of equipment purchasing power.

The BLS index will move higher in December when additional price hikes are covered.

Among companies which upped prices since we checked a month ago are Allis-Chalmers, Barber-Greene, and Mack Truck.

Allis-Chalmers crawler tractor prices rose an average of 8% last month. A-C self-propelled scrapers rose about 5%.

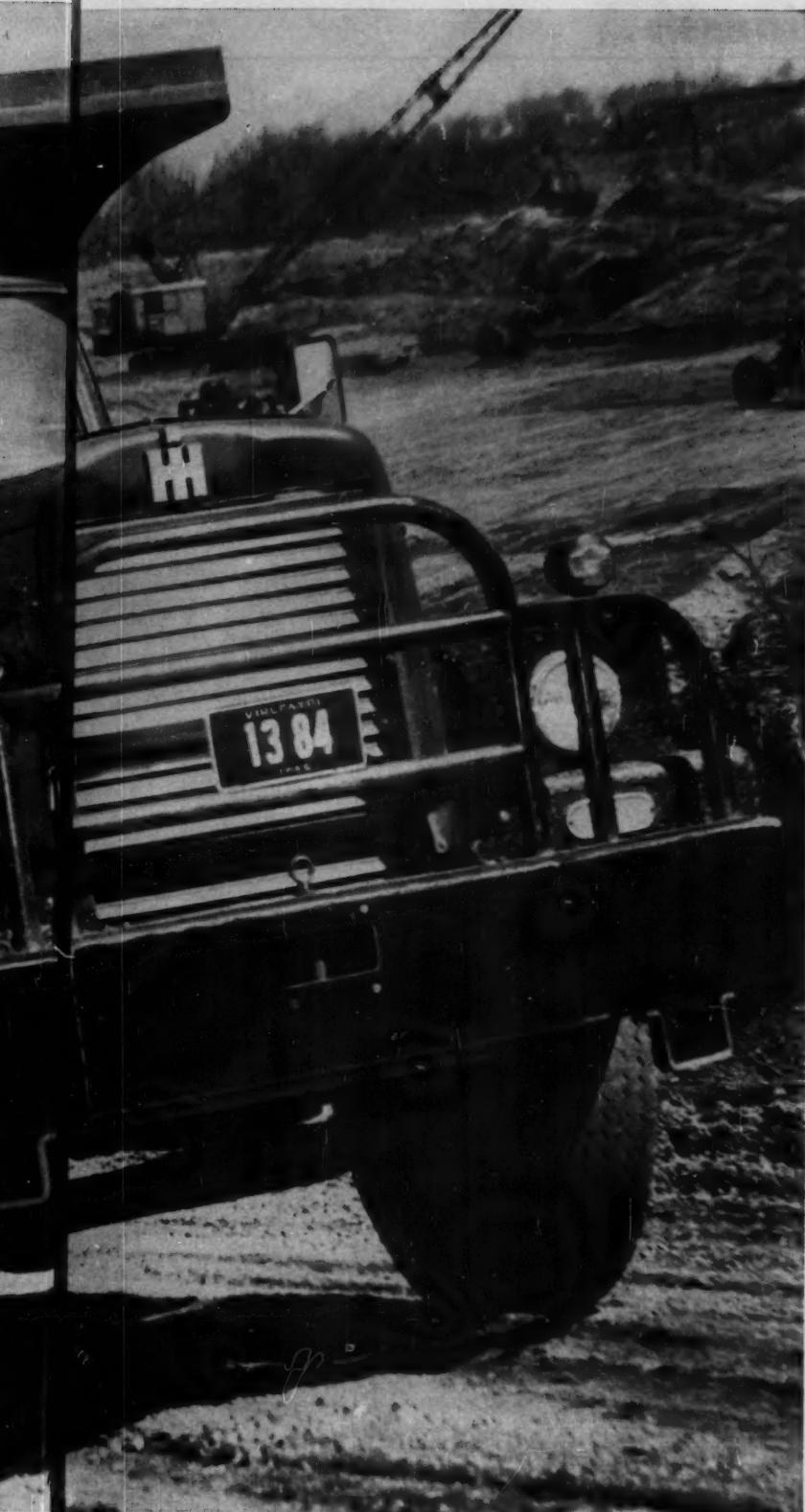
Barber-Greene prices for bituminous paving machines rose 3.5%, and asphalt plants went up 4%-5% on December 1.

Mack Truck raised prices of off-highway dump trucks an average of 3%. But while some models rose as much as 5%, a couple were marked down slightly (including the 22-ton rear dump truck).



INTERNATIONAL TRUCKS

Page 28 — CONSTRUCTION METHODS and Equipment — January 1959



S cost least to own!

TOUGH AND READY

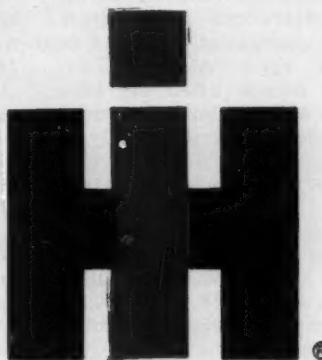
**Where
muscle
makes a road!**

Built for keeps to keep highway building on the move, this INTERNATIONAL model RDF-230-H is tough . . . ready to go anywhere, do anything!

A high-torque, low rpm Cummins NH-series diesel engine and rugged axles (46,000 lb. tandem rear and 15,000 lb. front) bull back-breaking loads over washboard terrain with sure dependability — round the clock, if necessary.

Take a good look at its extra-heavy-duty diamondette sheet metal, heat-treated alloy double-channel frames, simplified steering geometry that makes for flat angle, low friction ease of handling. You'll know why more heavy-duty construction operators are counting on this INTERNATIONAL Truck.

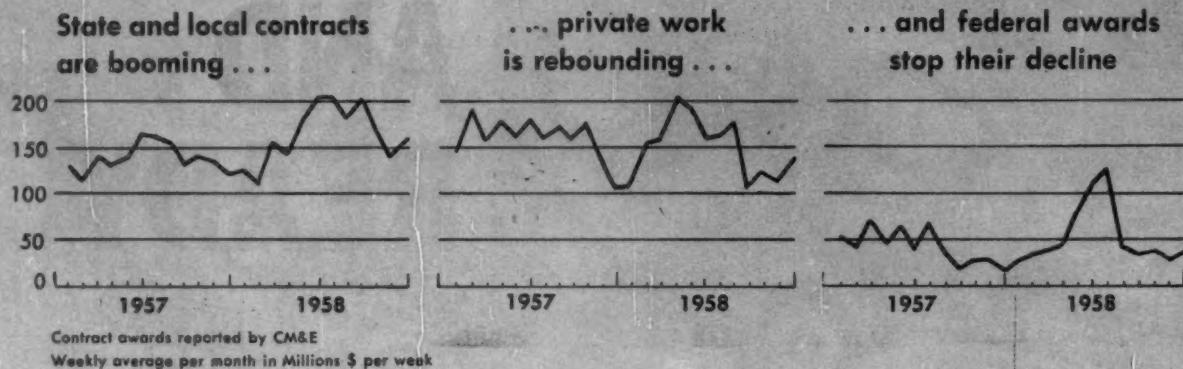
See your INTERNATIONAL Dealer today! He's got the know-how and *the truck that's got it* for your job!



INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick®
Farm Equipment and Farmall® Tractors

Construction Business . . .

Heavy Construction Contracts Show New Strength



Prospects for 1959 Look Good

CONSTRUCTION MEN can look ahead with new confidence that their market is growing again. 1959 contracts should add up to 5% more new business than the 1958 total, the second best on record.

Last year will be remembered as the year heavy construction contract awards staged a spectacular recovery after an 18-month recession. The sharp upturn ran out of steam, however, late in the summer. Awards for private and federal work sagged badly. When state and local contracts turned lower, as is usual in the late fall, November over-all volume tumbled almost to the low level of January, 1958.

But December roared back with the highest rate of contract awards reported by *Construction Methods* since August. Last month's volume lifted the 1958 total to \$19.2 billion, 7% more than in 1957 and second only to 1956's colossal \$21.7 billion.

This sets the stage for further gains in 1959. *Construction Methods* forecasts that heavy construction contracts will rise 5% this year to a total of \$20.2 billion (CM&E, Aug., 1958, p. 45). This is not up to the 1956 peak, but it closes much of the gap created by the 18-month recession in awards. The 1959 total is forecast to be 14% higher than 1957.

It will replace 1958 as the second highest year for heavy construction contractors' new business.

New Records in 1958

New records for major types of heavy construction went on the books in 1958, despite the fact that total volume was below the 1956 peak. Contracts for heavy construction other than buildings topped \$8.2 billion, a thumping 15% jump above the previous high set in 1957. Setting new records were: highways, up 26%; sewerage, up 11%; earthworks-dams-waterways, up 8%; and public housing, up 64% (mainly "Capehart" military housing units).

Though they didn't set new highs last year, these types of work racked up increases over the 1957 volume: public buildings other than housing, up 64%; private mass housing, up 23%; commercial building, up 2%; and public "unclassified," up 40% (mainly airports and missile bases).

Only two major types of public works declined in 1958 below their 1957 totals: waterworks, down 17%; and bridges, down 9%. But private industrial building sagged 43% under 1957, the biggest drop for any type of heavy construction. Private "unclassified" (mainly pipelines,

electric power and telephone lines) dropped 14%.

More Records in 1959

Contract awards for most major types of heavy construction are expected to rise above their 1958 totals this year. New all-time highs are predicted for waterworks, sewerage, bridges, and highways.

Substantial increases over 1958

Forecast: 1959 Contract Awards

As Reported by *Construction Methods*
(In millions of dollars)

	1957	1958	1959 Change
	Ac- tual	Ac- tual	Fore- '58-'59 cast %
ALL HEAVY			
CONSTRUCTION	\$17,986	\$19,165	\$20,150 + 5
OTHER THAN			
BUILDING	7,114	8,209	9,025 + 10
Waterworks	369	306	450 + 47
Sewerage	556	618	650 + 5
Bridges*	781	713	885 + 24
Highways	2,964	3,729	4,000 + 7
Earthwork, waterways	969	1,045	800 - 23
Unclassified,			
public	975	1,369	1,600 + 17
private	500	429	640 + 49
BUILDINGS	10,872	10,955	11,125 - 2
Private			
Mass housing	3,039	3,739	3,850 + 3
Commercial	1,754	1,795	1,925 + 7
Industrial	3,081	1,756	1,850 + 5
Public			
Nonresidential	2,353	2,610	2,600 0
Housing	642	1,055	900 - 15

* Includes private bridges



Parts you can trust. Dependable, round-the-clock service.

Special report to Caterpillar owners:

PROOF OF THE DIFFERENCE IN THE CAT "HI-ELECTRO" HARDENED CUTTING EDGE

Whether loading scrapers or bulldozing, the cutting edge takes more punishment than any other part of the machine—more punishment today than ever before. New, larger, more powerful machines put greater demands on cutting edges. And the edge that's holding up best and lasting the longest is the Cat "Hi-Electro" hardened cutting edge—the edge with the difference. From all over the country, documented results from on-the-job comparative tests with other makes of edges confirm this fact. The best buy is the Cat edge.

• • •

Field tests prove that the edge with the difference, the Cat cutting edge, not only outwears other make edges of the same thickness; it even outlasts the thicker edges of other manufacturers. The reason: Caterpillar engineers perfected a hardening process to give steel the right blend of toughness and hardness—toughness to prevent breaking, hardness to prevent bending and rapid wear.

• • •

Quality edges start with quality steel, tested in Caterpillar's laboratories for the right chemical composition and physical characteristics. Only steels meeting these exact specifications are accepted, and further tests are made at every stage of production.

CROSS SECTION of edge showing armor-like case and its shock-absorbing core.

NOW AVAILABLE—NEW MULTI-SECTION 'DOZER EDGES

New multi-section 'dozer edges developed by Caterpillar for the D8 and D9 show the way to reduced blade costs and easier blade changing. Reduced blade costs can result from piece-by-piece replacement. You can now reverse and replace the worn sections. Changing is easier than ever before.

• • •

Service tip: When installing new or reversing "Hi-Electro" hardened edges, clean all dirt from the matching surfaces. Be sure that all bolt heads are properly drawn in to their holes and correct nut torque applied. This assures proper cutting edge support and maximum strength.

• • •

Your Caterpillar dealer has the complete story on the advantages of using the new Cat multi-section 'dozer edges. He backs you with dependable, round-the-clock service and parts you can trust. See him today!



NEW EDGES are now available for the D8 Bulldozer in left and right sections shown here. New edges for the D9 come in left, center and right sections.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR
Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

volume also should come in private and public "unclassified," commercial building, and private mass housing. Industrial building should also top 1958. But less new work is expected to be available in earthwork-dams-waterways.

The new year is getting off to a much better start than 1958. 1959 first quarter volume should top last year by a wide margin. Public works and private heavy con-

struction other than housing and industrial will spark a large volume of awards.

Though starting at a slow pace, mass housing and industrial building contracts are expected to perk up around mid-year and finish stronger during the last half of the year. Housing should finish the year about 3% above 1958, and industrial building may exceed this year's low volume.

A recent upturn in proposed

industrial building entering the *Construction Methods* Backlog of Heavy Construction in the planning stage indicates a rise in contract awards in the last half of 1959. However, a really strong recovery in industrial building awards seems more likely to come in 1960 rather than late 1959.

Legislation a Key

What the new Congress does in the way of construction legislation will have a big impact on contract awards for airports, housing, college, hospital, school, atomic reactor, hydro power, flood control, and military construction. Highway legislation this year will have little effect on highway and bridge contracts in 1959.

With such a broad cross-section of the heavy construction market sensitive to federal legislation, it's obvious that construction men should keep tuned to developments in Washington.

Construction legislation probably will move slowly because nearly every program faces a battle between opposing factions in Congress. There are also major differences between Congress and the Administration on some programs. The President, whose budget for fiscal 1960 is less than the 1959 budget, may use his veto power more this year than he did last year.

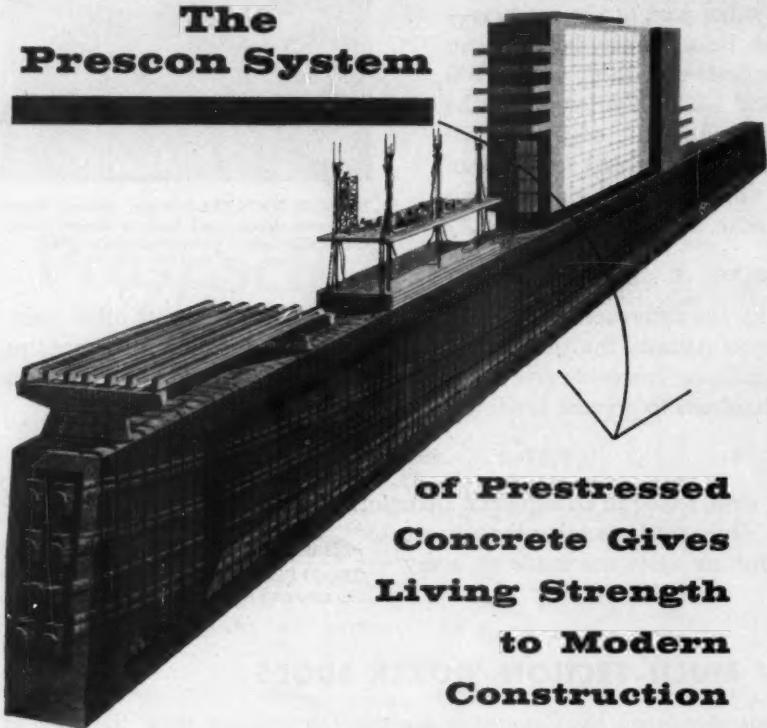
SOME BIG CONTRACT AWARDS OF THE MONTH

Stone & Webster Engineering Corp., 49 Federal St., Boston, Mass. Design and construct 600,000-kw generating plant, Brayton Point, South Somerset, Somerset, Mass. Mantauk Electric Co., Riverside Ave., Somerset, Mass. \$20,000,000.

Gilbane Bldg. Co., 90 Calvary St., Providence, R. I. Construct 900 units, Penn Towers apartment project, 18th & 19th Sts., Philadelphia, Pa. Penn Towers, Inc., 8601 Germantown Ave., Philadelphia, Pa. \$20,000,000.

Henry Kaiser Co. & Raymond International, Inc., 1924 Broadway, Oakland, Calif. Construct a rock-fill dam on Green River near Tacoma, Washington. Corps of Engineers, 1917 S. Alaskan Way, Seattle 4, Wash. \$8,840,000.

The Prescon System



of Prestressed Concrete Gives Living Strength to Modern Construction

The "live" strength of steel under tension has made prestressed concrete the modern miracle construction material, allowing it to be used for long span beams and girders, lightweight decking members, high strength, low weight walls and for many other applications undreamed of in the past.

The Prescon System of post-tensioning has been proved to be the simplest, the most uniform and the most economical method of prestressing concrete to make it into a low cost, high strength building material.

When you plan your next structure, consult your Prescon Representative for engineering and design recommendations for using Prescon System prestressed concrete to give you design freedom with low cost construction.

THE PRESCON CORPORATION

GENERAL OFFICES and SOUTHWESTERN DIVISION:

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Tulip 2-6571

Corpus Christi, Texas

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Drake 7-3853
North Decatur, Ga.

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Crest Concrete Systems, Inc. 1445 West Quincy
P. O. Box 38
Bishop 2-1479
Lemont, Ill.

DENVER

SUNSET 1-4798
Englewood, Colo.

LOS ANGELES

P. O. Box 407
Faculty 1-3377
Gardena, Calif.

MEMBER PRESTRESSED CONCRETE INSTITUTE



Now a DIESEL Engine for JOHN DEERE 440 TRACTORS

Bringing you every Diesel advantage **Plus 10% MORE POWER!**

Here it is! The GM Diesel, known throughout industry for its economy, dependability and long service! Power-matched to John Deere "440" Tractors, the engine carries the following specifications:

Design

Engine Type . . . 2-cycle, 2-cylinder
Bore and Stroke . . . 3-7/8 in. x 4-1/2 in.
Displacement . . . 100.1 cu. in.
Compression . . . 17:1

Performance

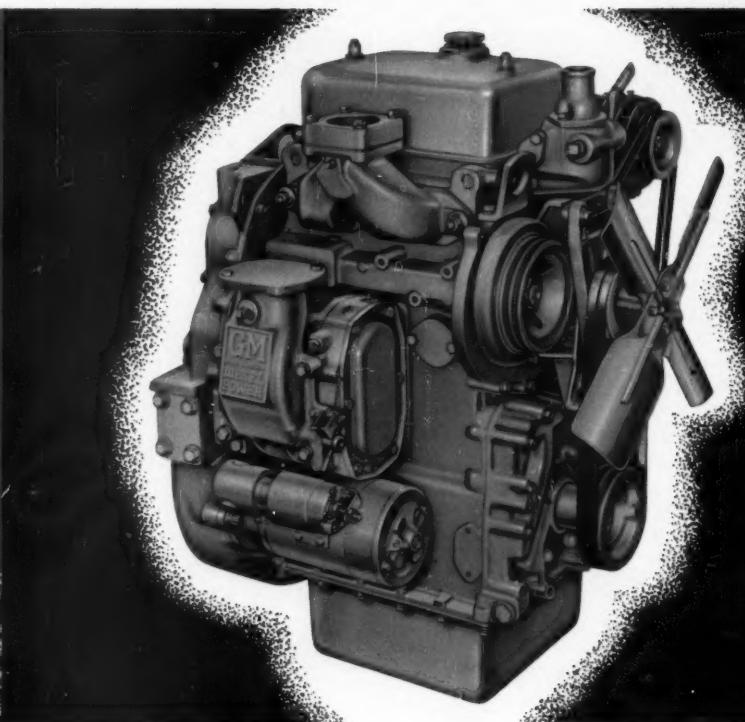
Rated hp at 1850 rpm . . . 33-1/4
Max. Torque at 800 rpm . . . 108 lb. ft.



"440" Crawler with matching 831 Loader gives you a smooth-working combination for many jobs.



"440" Wheel Tractor with 71 Loader and 5-1/2 yard bucket does an efficient job of loading.



Diesel power and *more* power—10 per cent more than previous "440" Tractors—give John Deere "440" Crawler and Wheel Tractors extra capacity to take on more jobs—make even greater savings in time and fuel—turn out more work per day.

The new John Deere "440" Diesels provide the extra efficiency of high-compression Diesel engine—plus the fast response of high-torque Diesel performance. In addition, John Deere Industrial Tractors with GM Diesel engines provide the "fire insurance" of Diesel fuel which opens up new construction and materials-handling jobs to the John Deere "440"—in mines, dockyards, and other confined areas.

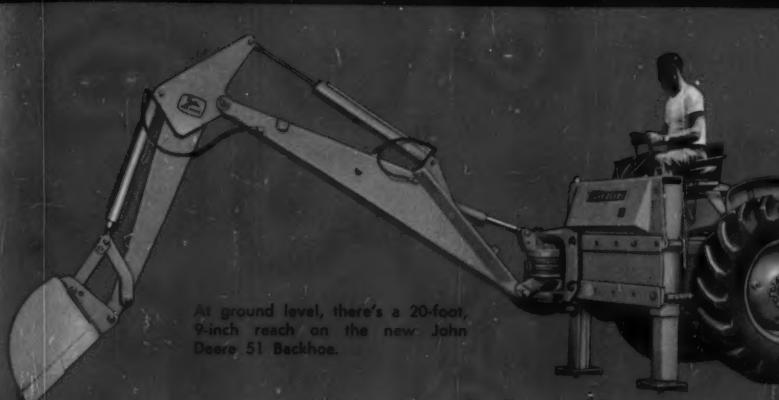
Whatever your reasons for preferring Diesel power, start now—cast in on modern Diesel advantages in a John Deere "440" Crawler or "440" Wheel Tractor and matched working equipment.

Below: "440" Crawler with 64 Dozer and Scarifier—a favorite unit with builders and contractors.

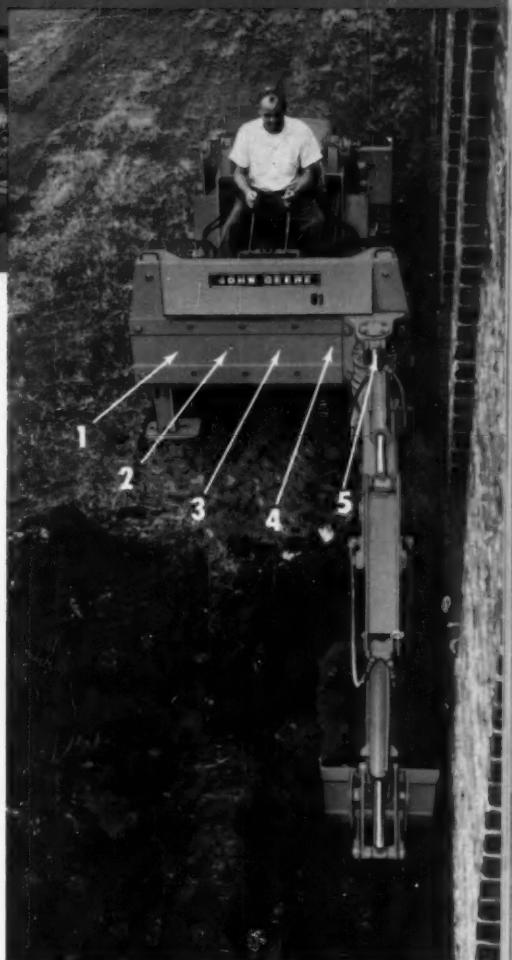


Below: 71 Loader, equipped with blade, tackles a wide variety of work. "440" Wheel Tractor provides power to sp





At ground level, there's a 20-foot, 9-inch reach on the new John Deere 51 Backhoe.



Introducing the FIRST 5-Position BACKHOE in the Field...

THE New JOHN DEERE 51

One of two great new John Deere Backhoes, the model 51 provides unmatched operating flexibility. Designed to operate from any of five positions, the boom can be shifted with hydraulic power to any position in 15 minutes. One man with a wrench does the job!

In operation, the husky hydraulic cylinders of the 51 provide plenty of "breakout" power for tough or frozen ground conditions. From a working depth as great as 13 feet 6 inches, the bucket rises to a dumping height of 11 feet 9 inches, to load even the largest trucks. Boom swings through a 180-degree arc.

Flush-digging along buildings or fences is simple with the 51 mounted at first or fifth position. Operator has excellent view of both digging and spoil pile. In transporting, end position permits hoe to be folded against tractor to make a compact, well-balanced unit.

Plus ... a brand-new center-position BACKHOE

THE JOHN DEERE 50

Here's reach and power to tackle any trenching job! Center-mounted boom has a 20-foot 3-inch reach at ground level, swings smoothly through a 205-degree arc by hydraulic power. Just two control levers do the job, while the operator sits in comfort.

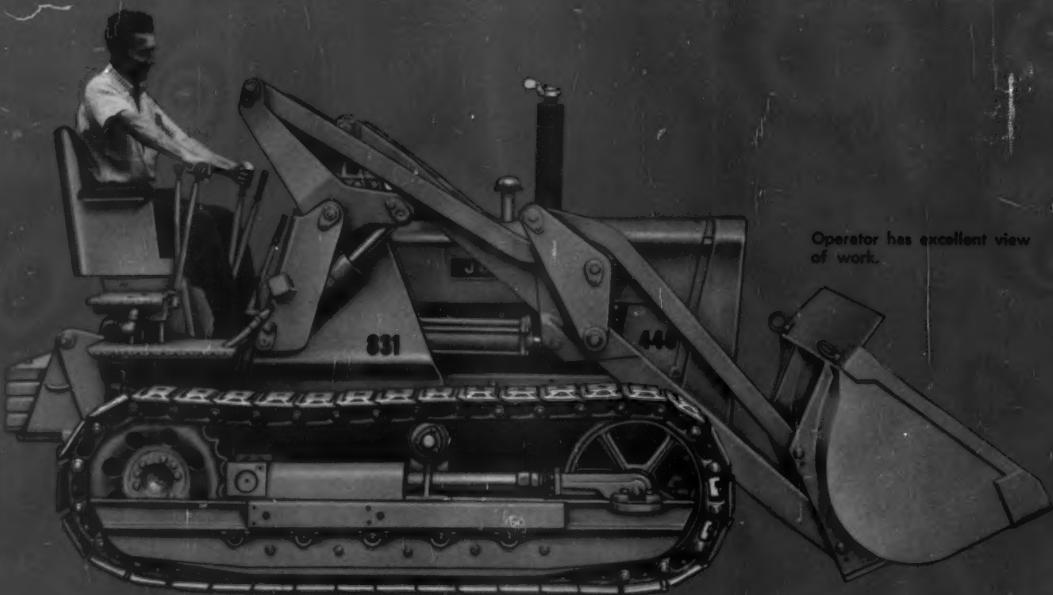
Bucket has side-cutting edges and replaceable teeth.

One hydraulic system powers both loader and backhoe.



Working depth of the 50 Backhoe is 13 feet 6 inches.





**A new answer to speedy
low-cost loading**

THE JOHN DEERE 831 LOADER

Take your choice of gasoline or Diesel power, but pick the John Deere 831 Loader for a *new low* in earth-moving costs! High-lift bucket has 7-1/2-yard heaped capacity, welded cutting edge and spill sheet. Rugged construction plus the husky hydraulic system of the "440" provides *pry-out* pressure and lifting ability that greatly increase daily work capacity.

When the bucket is dumped from the full-height position, it returns to the ideal 9-degree digging angle by use of the *boom control only*—a great convenience for operators and one of many reasons for the 831's fast cycle time.

In a recent test, the Diesel-powered 831, handling loose soil from a stockpile and working in third speed, filled 20 standard dump trucks in one hour, using only two gallons of fuel.

Check on this new John Deere 831 Crawler-Loader now—start setting your *own* records for low earth-moving costs!

JOHN DEERE INDUSTRIAL DIVISION Moline, Illinois, Dept.

Please send information on the "440" Diesel Crawler "440" Diesel Wheel Tractor 50 Backhoe 51 Backhoe 831 Loader.

Name _____

Firm _____

Address _____

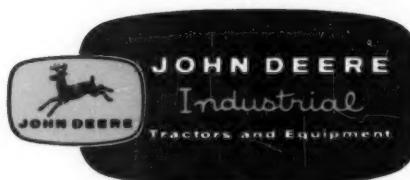
City _____ State _____



Bucket has a 35-degree roll-back at



Self-leveling bucket has a full-height dumping angle of 50 degrees.



**THERE IS A
JOHN DEERE
Industrial Dealer
Near You...
Ask him for a
demonstration!**

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\$1,000,000 RECONSTRUCTION JOB

**Saves New York City Vehicular
and Transit System Bridge**



River Water Seepage Problem Solved With Marlow Pumps®

The Roosevelt Avenue Bridge, over the Flushing River in Flushing, New York, carries trains of the city's transit system, as well as heavy highway traffic. Recently, it was noticed that the structure was sinking, endangering both highway and train travel. To correct this, a contract was issued by the Department of Public Works of the City of New York to the Woodcrest Construction Company for the reconstruction of the West approach to the bridge.

When the two-decked structure was originally built, it used wood piles sunk 70 feet below grade. As the ground on

the site is mostly filled with fly-ash from incinerators, new steel piles were driven to between 100 and 120 feet below grade to properly support the new bridge abutments.

Seepage from the nearby river became a very serious problem when digging excavations for the abutments. In addition, the abrasive nature of the fly-ash fill could cause trouble to the pumps. To solve both problems, Ed Good, General Superintendent for Woodcrest, set up a 6E4 Marlow Contractors Pump. Running six hours a day, this 90,000 GPH, self-primer, sold by Foundation Equipment Co., completely controlled

the onrushing water. The 360° cleaning action of the Marlow kept the casing clean and, because there were no close clearances in the pump to wear, the abrasive liquid caused no trouble in the units. Ed Good had used Marlows for some time and knew they would perform without trouble.

Marlows can help solve your construction pumping problems. There's a unit from Marlow's complete line of self-priming and diaphragm pumps that's just right for your job. Write today for the name of your Marlow dealer and a copy of Marlow Contractor Pumps Bulletin C-09.



MARLOW PUMPS®

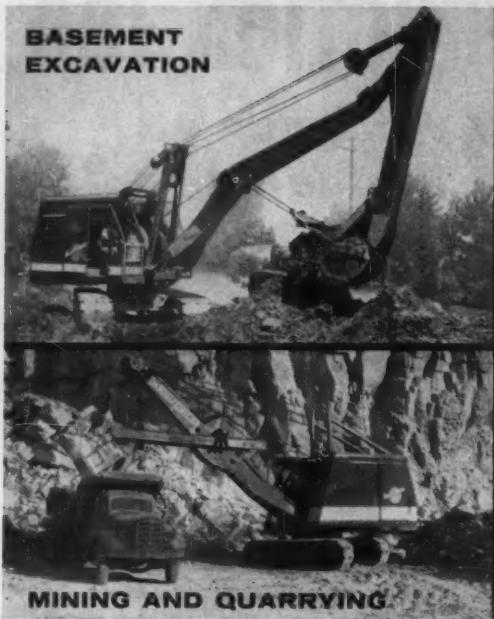
DIVISION OF BELL & GOSSETT CO.

Midland Park, New Jersey

Morton Grove, Illinois • Longview, Texas

B-275

BASEMENT EXCAVATION



MINING AND QUARRYING

SETTING STEEL

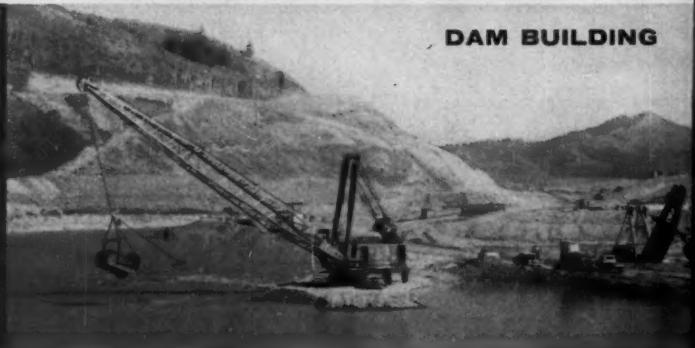


IF YOUR JOB IS HERE . . .

BRIDGE CONSTRUCTION



DAM BUILDING

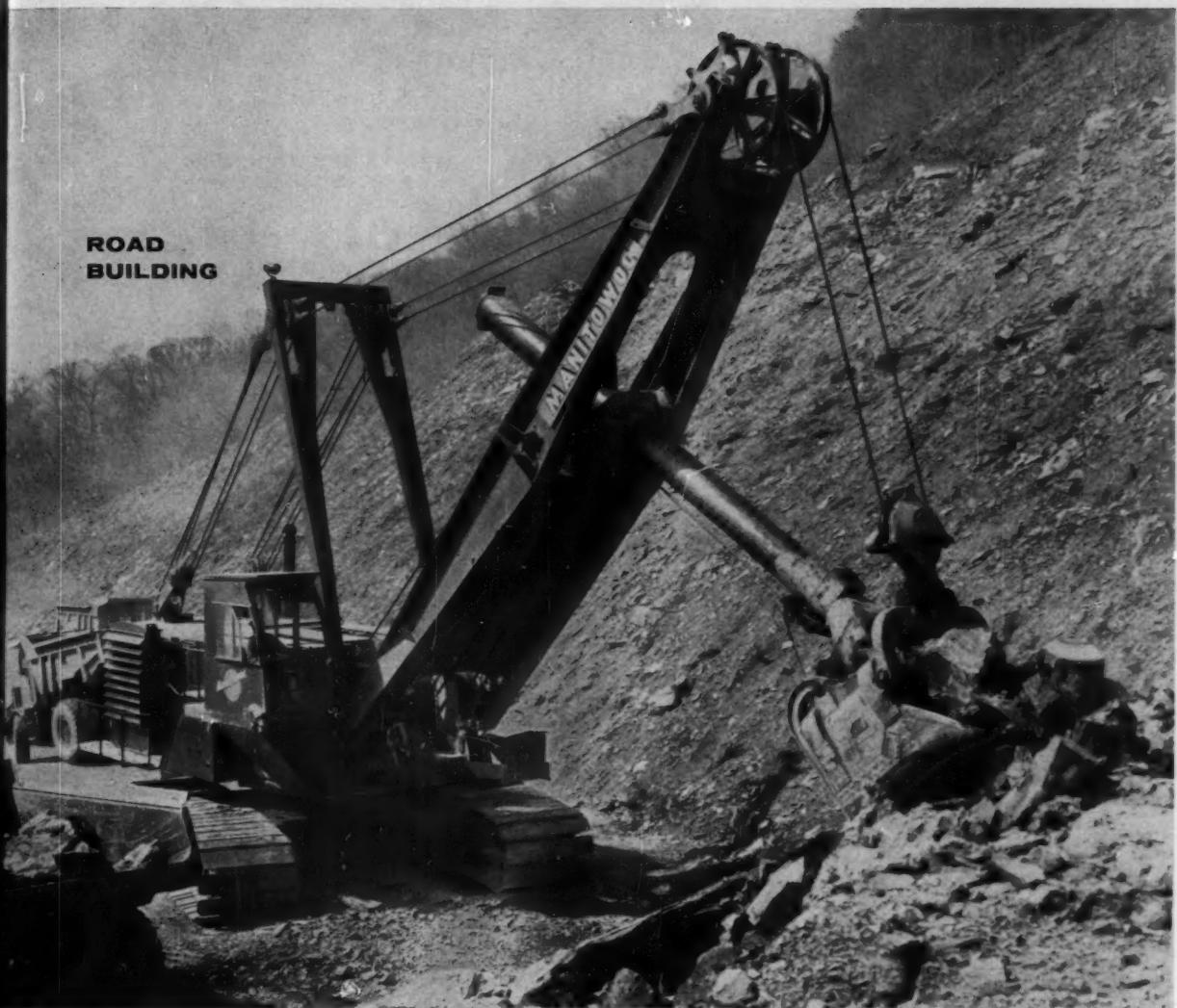


THERE'S A MANITOWOC

	MOUNTING	SHOVEL	CRANE	DRAGLINE
model 2000	crawler	1 1/4-Yd.*	25 Ton	1 1/4-1 1/2-Yd.
model 2300	crawler	1 1/2-Yd.*	35 Ton	1 1/2-2-Yd.
model 2800	rubber	.....	40 Ton	1 1/2-2-Yd.
model 2900	rubber	.....	60 Ton	1 1/2-2-Yd.
model 3000	crawler	2-Yd.*	40-50 Ton	1 3/4-2 1/4-Yd.
model 3500	crawler	2 1/2-Yd.*	60 Ton	2-2 1/2-Yd.
model 3500TC	rubber	.....	80 Ton	.....
model 3600	crawler	3-Yd.*	65 Ton	3-Yd.
model 3900	crawler	.....	60-80 Ton	3-3 1/2-Yd.
model 4500	crawler	5 1/2-Yd.	100 Ton	6-Yd.

* Also available as trench hoe.

ROAD
BUILDING



FOR YOU HERE

Look over the Manitowoc model chart at the left and compare capacity ratings. No matter what type of jobs you handle, general contracting or specialization in one field, you'll find that Manitowoc is THE LINE for '59!

For fast transit between jobs with big lift capacity on the job, there are two self-propelled truck cranes and the new Model 3500TC 80 ton mobile crane. There are powerful, fast-cycling shovels for any excavating project from residential basements to

expressway construction. Of course, for setting steel, pouring concrete or any other precise lift work nothing matches the power, speed and control of Manitowoc cranes.

In the area of marine construction, dredging, canal excavation and shoreside material handling Manitowoc machines (many times mounted on Manitowoc-built barges) have proved to be the most adaptable to the special needs of this field.

Before you bid on any job in 1959 check with your Manitowoc distributor. He'll be happy to recommend the unit that will help you be low bidder with greater profit from those narrow margin contracts.

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)

MANITOWOC, WISCONSIN

Knuckles right down

to any job!

This rugged heavyweight asks no quarter, it just wades right in and polishes off tough hauling jobs. Two high-capacity "live" rear axles give it better flotation and traction on soft ground. And its 234-hp. engine, with dual carburetors standard, gives this T900 tractor the big-chested power to handle the big hauling jobs without tiring.

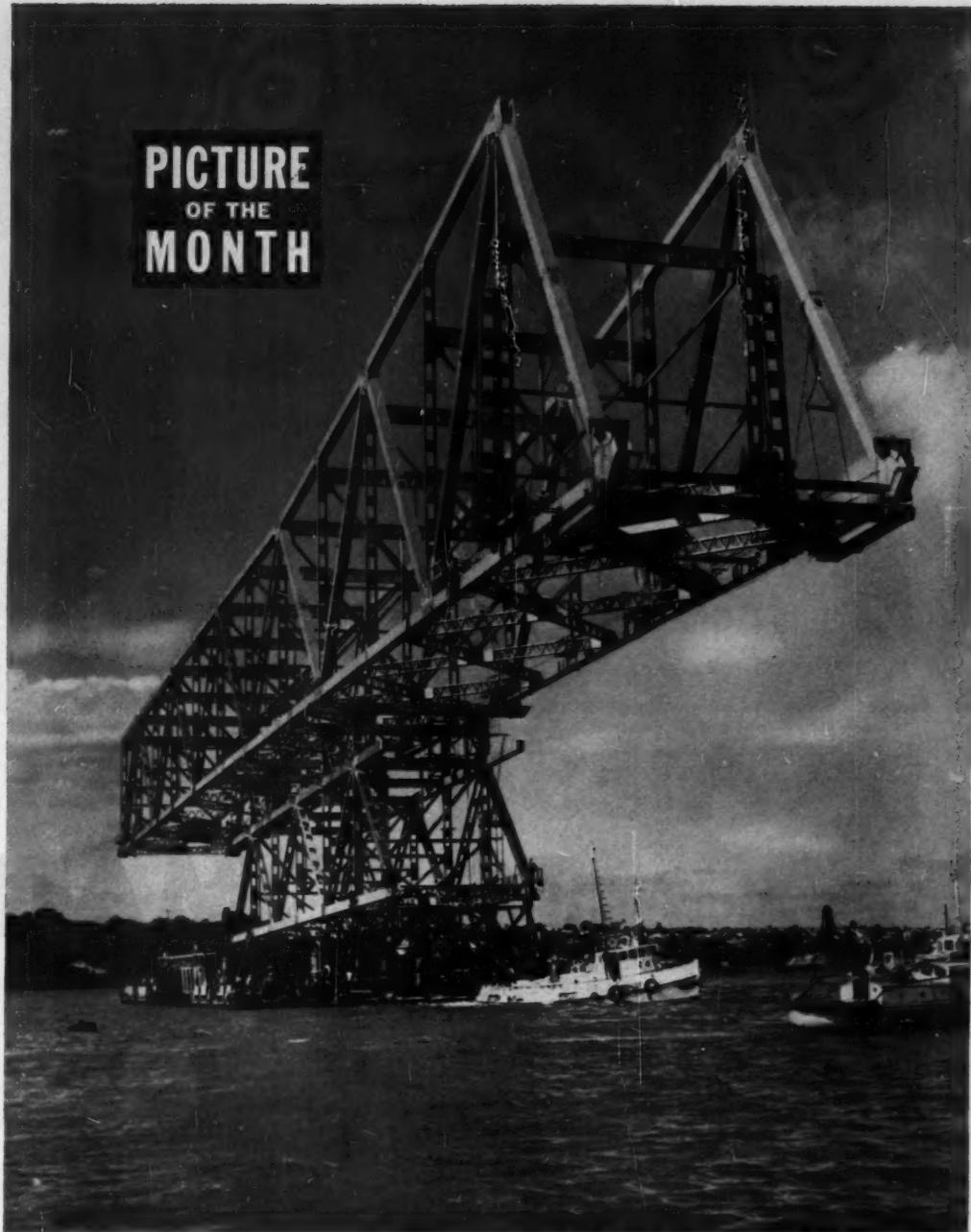
The new Dodge tandems are packed with features that make heavy-duty hauling easier and more profitable: New instrument clusters, with tachometer and graduated ammeter and oil pressure gauges standard . . . suspended brake and clutch pedals . . . 90-degree-opening hood for easy servicing . . . air brakes standard on T900 models . . . up to 20 speeds forward. But see your Dodge dealer—and get the *heavy-duty* reasons why . . .

today,
it's real smart
to choose **Dodge**
Trucks



Built throughout for dependable heavy-duty service, this 354-cubic-inch V-8 has dome-shaped combustion chambers . . . double rocker-arm shafts . . . precision timing gears instead of chains . . . positive exhaust-valve rotators . . . hydraulic tappets . . . sodium-cooled exhaust valves. And it develops full power on thrifty *regular* gas!

**PICTURE
OF THE
MONTH**



Bridge Span Rides Piggy-Back

• A 1,200-ton span for the Auckland Harbor Bridge in New Zealand rides into place on top of a smaller span of the same bridge. Steel erectors assembled the 580-ft mid-harbor span on top of a completed portion of the bridge near the shore, floated four big barges under it, bolted the bearer span to the superstructure of the barges, and floated the two spans out on a rising tide. The next day they placed the big span in position on its piers with the help of a falling

tide, then returned the bearer span to its original position. Cleveland Bridge-Dorman Long, the joint venture contractor, chose the method partly because the big mid-harbor span is wider than the rest of the bridge; it would have been difficult to tie it back to the adjacent span if it had been erected by cantilevering. Setting intermediate falsework for a cantilevered span also would have been difficult; the bridge at that point is 75 ft above water that is 80 ft deep.



MERRITT-CHAPMAN & SCOTT

GOES FOR TORQMATIC



Shale, limestone, dolomite and sandstone combine to make the going tough. That's why blasting is almost continuous at job site.



Loaded downgrade, empty up—that's the Niagara Generating Plant hauling story. Grades are steep as 15%.

ANY WAY you measure it—yards, dollars, kilowatts—the Niagara Power Project of the Power Authority of the State of New York is really big.

When completed in 1962, more than 40 million cubic yards of earth and rock will have been moved—over 705 million dollars spent—more than two million kilowatts made available to homes and industry.

Handling a big part of that job is Merritt-Chapman & Scott Corporation, one of the nation's biggest construction firms.

Their contract on the Niagara Generating Plant and the Water Intake Structure, the project's two key sections,



When completed, the Niagara Power Project will be one of the largest sources of hydroelectric power in the Western Hemisphere.



Some of the equipment M-C-S has working on the Niagara Power Project's main generating plant at Lewiston, New York. TORQMATIC-equipped IHC and Euclid trucks will have moved 10,000,000 cubic yards of rock and earth in about 3 years to build the power plant.

to keep the Niagara power plant job rolling

adds up to over \$165,000,000. The power plant alone calls for the excavation of better than 10,000,000 cubic yards and is scheduled to be completed by early 1962.

That gives them about 1100 working days to get the job done—and to help meet this deadline Merritt-Chapman & Scott has picked TORQMATIC DRIVES for its fleet of International Harvester and Euclid trucks on this gigantic project.

You get an idea of how fast the job is going from the simple fact that these trucks are moving 36,000 cubic yards of earth in every 24 hours, despite 15% grades which start after only a 150-foot run.

Availability records are very high, largely because of the heavy emphasis placed on preventive maintenance by M-C-S—but also because of the ability of the TORQMATIC DRIVES to take the rough job conditions. With a lot of downhill hauling involved, the TORQMATIC Brakes are largely responsible for greatly extending regular service brake life, because it saves them for everything but full stops.

If you'd like to meet or beat your contract deadlines at a profit, take a leaf from the books of leading contractors—put TORQMATIC DRIVES to work for you.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

Allison
TORQMATIC® DRIVES



WHEN EVERY MINUTE COUNTS...



Project: Bridge, U.S. Highway #79 Relocation, north of Marianna, Arkansas.
Part of Madison-Marianna Floodway Project, St. Francis River Basin

To construct the piers for this 926' long bridge, the contractor also had to excavate for that portion of the Madison-Marianna Floodway ditch channel under the bridge structure.

This involved digging 45' down in sandy clay, black gumbo, and sand — all of it WET!

Under constant threat of floods from the

critically high water level in the St. Francis Basin, four 8" Moretrench Pumps and 280 Moretrench Wellpoints, pumping over 6,000 gallons per minute, kept the hole dry. Contractor's crews worked around the clock to complete this important part of the Floodway Project.

When every minute counts — as it does on any wet job — count on a **MORETRENCH WELLPOINT SYSTEM** to keep you going — in the dry.

Call our nearest office for an accurate estimate on predraining your wet work.

MORETRENCH CORPORATION

90 West St.
New York 6
CO 7-2283

4900 S. Austin Ave.
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Portsmouth 7-4212

7701 Interbay Blvd.
Tampa 9, Florida
Tampa 61-1881

315 W. 25th St.
Houston 8, Texas
Underwood 4-7774

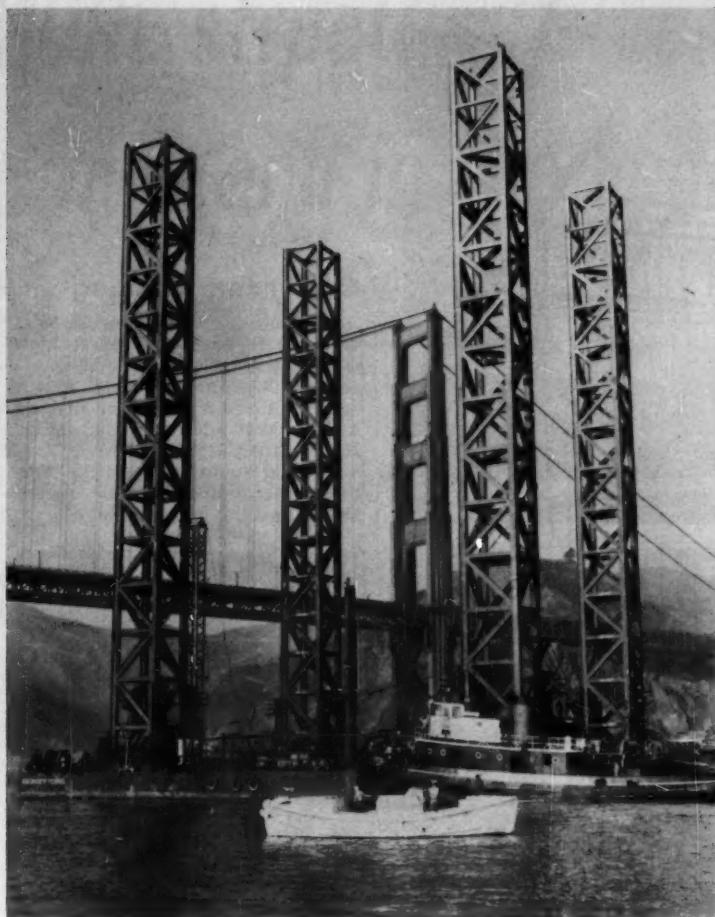
Rockaway
New Jersey
Oakwood 7-2100

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington

Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario

Brazilian Representative: Oscar Tavares & Co., Ltd., Rio de Janeiro

Construction News in Pictures . . .



Ocean Platform

Moving through San Francisco Bay is the biggest pipe-laying rig ever built. With it, Hyperion Constructors will lay 6 mi of 12-ft-dia pipe in water up to 200 ft deep for a Los Angeles sewer outfall. The rig walks from one position to the next by jacking down its platform until the entire unit floats, then winching itself forward.

Dozer-Compactor

On an interstate highway job near Mansfield, Ohio, V. N. Holderman & Sons, Inc., gets double service from a Michigan 180 tractor. Holderman fitted the Michigan with compactor wheels so that it can spread and compact fill at the same time. The contractor can pull off the compactor wheels and put on rubber tires in half a day.

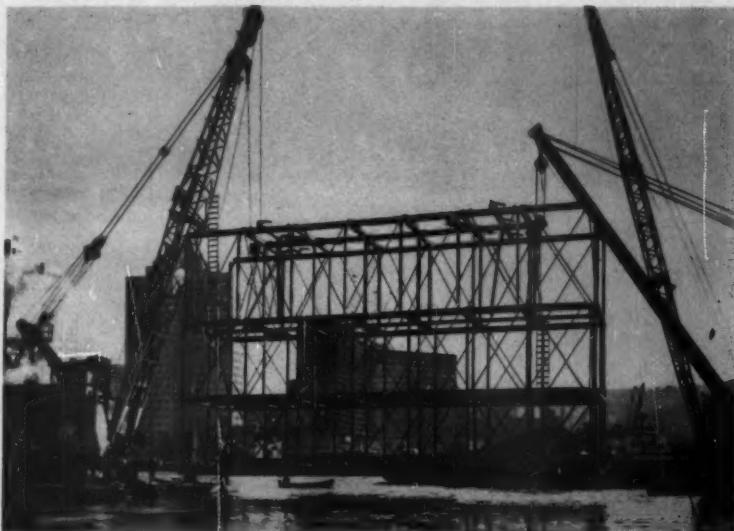
continued on next page



Sturdy Structure

Crews of Stone & Webster Engineering Corp. place reinforcing steel around the base of the housing for Yankee Atomic Electric Co.'s nuclear reactor at Rowe, Mass. The massive reinforced concrete structure will require 600 tons of steel and 12,000 tons of concrete. The atomic power project is scheduled for completion in 1960.





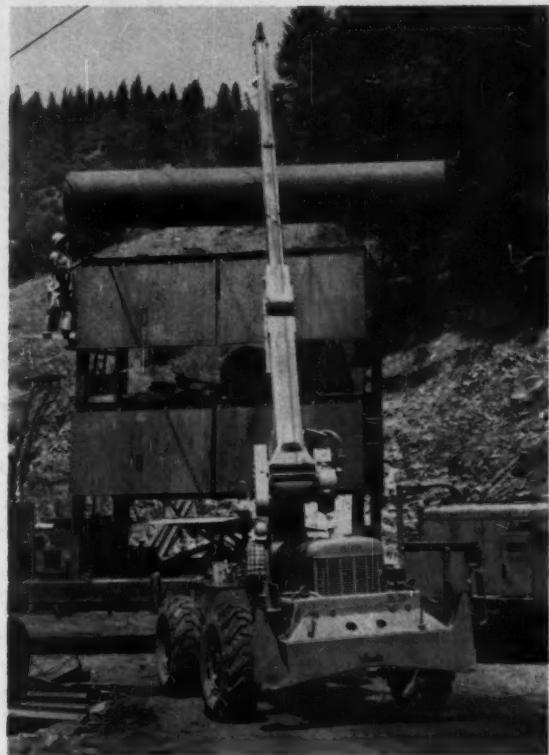
Cofferdam Bracing

A steel and timber framework 90 ft long, 25 ft wide, and 49 ft high starts toward the bottom of the Allegheny River at Pittsburgh. It will serve both as a guide for driving a steel sheet pile cofferdam and as bracing for the piling. Dravo Corp. will build a main pier for the double-decked, four-lane Fort Duquesne Bridge within the cofferdam.



Working on Water

Floating batch plant delivers concrete for piers of the 36th St. Causeway Bridge at Miami, Fla. It carries a Butler batch plant, two Rex truck-type mixers, and a Link Belt Speeder crane. A second barge supplies cement, water, and Gulf gasoline and diesel fuel. Heavy Constructors at Miami brings in aggregates on still other barges.



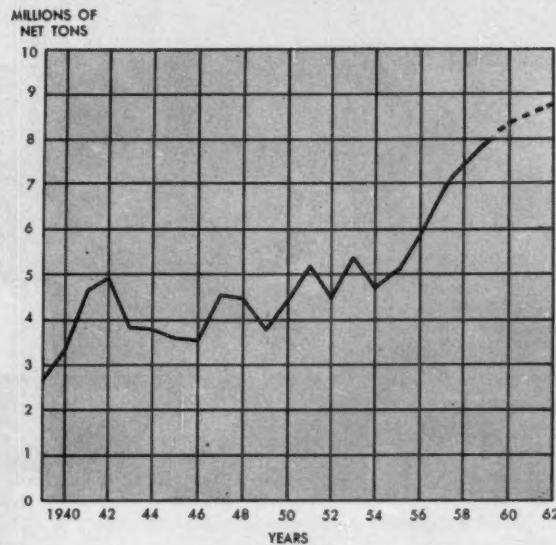
Tunneling Rigs

An Austin-Western crane with a telescoping boom loads 36-in. ventilation pipe, steel ribs, and timber lagging on a specially built rail car at a tunnel job in California. Peter Kiewit Sons' Co. is driving two large bore tunnels side by side to relocate the tracks of Western Pacific Railroad around the site of Oroville Reservoir.

MORE structural steel is available- now and in the years to come

In 1959 builders of highways, bridges and buildings will have available more steel than ever before. The steel industry (and Bethlehem Steel in particular) has expanded facilities for producing structural shapes so that there *is* steel for the job.

RISE IN STEEL INDUSTRY'S PRODUCTION OF HEAVY STRUCTURAL SHAPES



We estimate the industry will be able to turn out 8 million tons of structural steel in 1959. What's more, it is estimated that anticipated expansion will bring the industry's capacity up to 9 million tons annually by the mid 1960's.

BETHLEHEM INCREASES CAPACITY

Since our Bethlehem, Pa., plant is the largest single unit producing structural shapes in the country, its role is a most important one.

In 1955, for example, we were caught in a squeeze. We had foreseen the increased demand and had already started a huge expansion program a year earlier. Expansion on such a major scale required the shutting down of some facilities, and just at that critical period, the boom hit. So while we were in the midst of trying to relieve the shortage of the future, we were temporarily unable to turn out as much as before.

But it all paid off. Today Bethlehem is able to turn out over 3 million tons of shapes each year, or about 40 per cent of the entire industry's total.

Structural steel *is* available. You can plan and design in structural steel with complete assurance, both now and in the years to come.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



ALEMITE PORTABLE SERVICE STATIONS

help "heavyweights" work longer...do the job faster

ON NATION'S MAJOR ROAD PROJECTS!

On America's great new road jobs—and in Canada, too—Alemite power lubrication rigs help leading contractors win battles against time and high maintenance costs.

64% faster than hand lubrication methods, Alemite portable power units service equipment on the job—wherever and whenever they are needed. They eliminate costly delays due to slower lubrication methods...end trips to and from the grease shop...reduce chance of costly bearing failures.

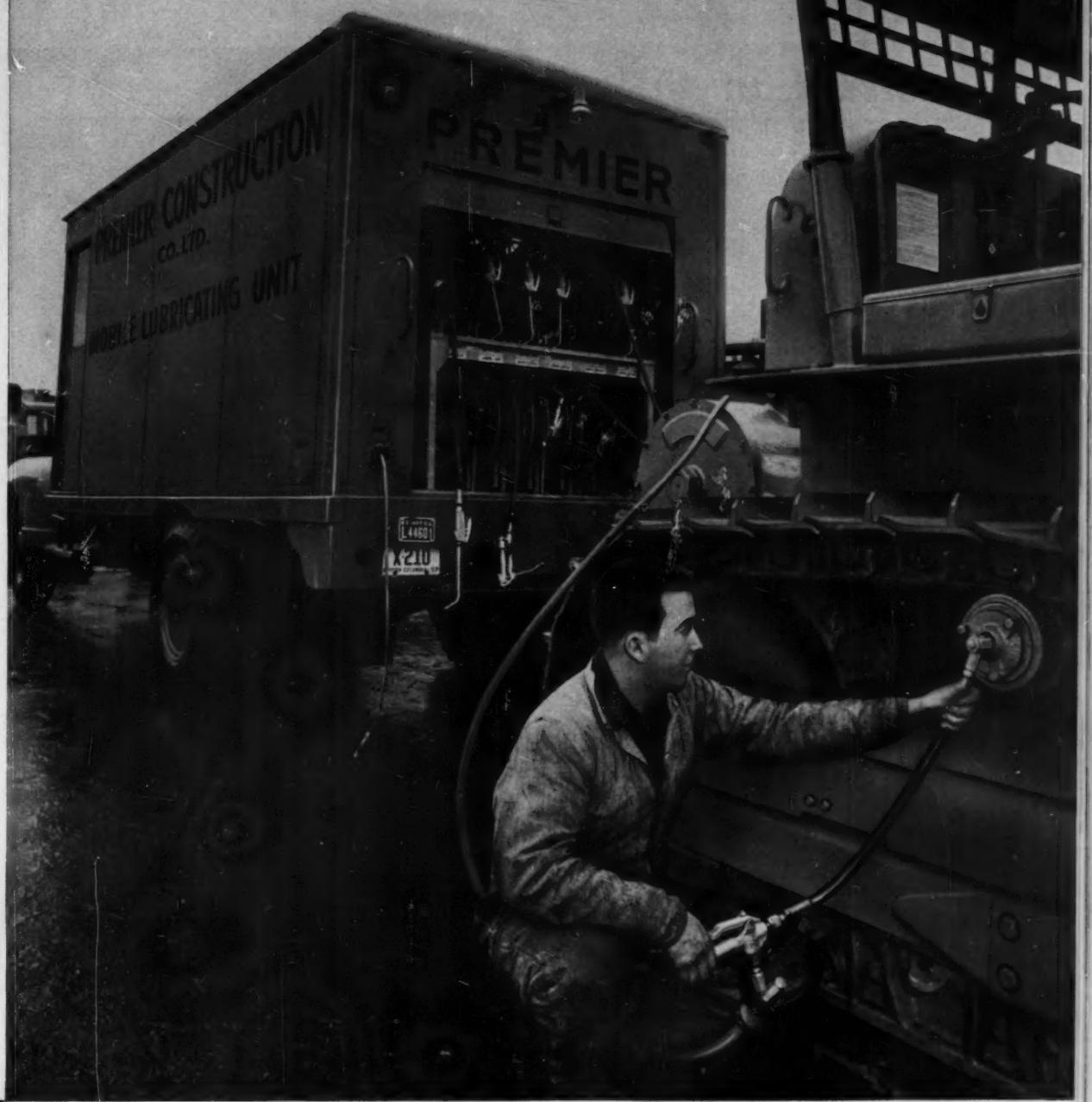
OPEN FLAT BED—7-pump, 9-reel service station built by W. E. O'Neil Construction Company.

Whether your operation is large or small, an Alemite outfit can be custom-built from standard Alemite equipment to meet your particular needs...and to give you important savings in time, money and equipment.



COMBINATION OPEN AND CLOSED UNIT—owned by Kuckenberg Construction Company, Portland, Oregon.





ALL-WEATHER VAN TYPE—used by Premier Construction Company, Ltd., British Columbia, 13 pumps, 14 reels.

**ALEMITE PORTABLE SERVICE STATIONS
HAVE HELPED CONTRACTORS BUILD:**

Illinois Toll Road • Northern Indiana Toll Road • New York State Thruway • Chicago Congress St. Expressway • Savannah River Atomic Energy Project and many other nationally known projects!



Fast, easy lubrication of track rolls and fittings.



Quick filling of final drives, gear housings, transmissions.



No engine oil wasted — delivers exact amount of oil required.



Air line equipment for on-the-job tire inflating, air cleaning.



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Construction 'Round the World . . .

In Italy

Versatile rail-riding rig developed by Opere Specializzate clamshells a deep trench for walls of Milan's Metropolitana Subway. The novel machine deposits excavated material into an attached hopper which, in turn, deposits it onto a conveyor that carries it to a train of muck cars that run parallel to the trench.



In England

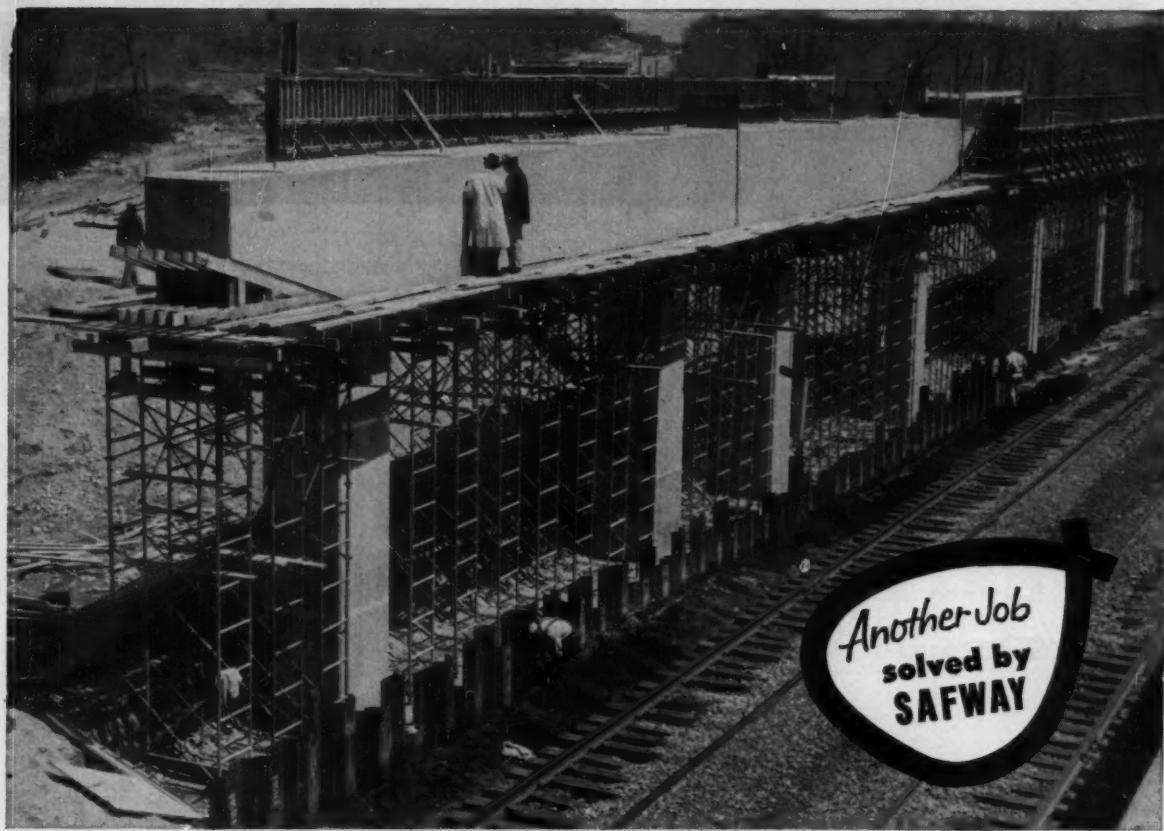
John Laing & Son, Ltd., employs a novel method for erecting the roof for a Royal Air Force hangar under construction at Abingdon. Laing jacks the roof up in three equal sections to a 46-ft height and builds supporting columns underneath during the raising. A 200-ton hydraulic jack at each corner provides the lift for each section.



In Germany

Work speeds ahead on construction of cut and cover tunnel that will pass under the famed Kiel Canal. Central portion of the tunnel will be built up of seven 64-ft-long sections that will be pre-assembled in a vast basin near shore then floated into position and sunk in a previously dredged channel.





Shoring a 4'x6'x87' Bridge Beam on the Massachusetts Toll Road

Bridge Shoring Method Saves 60%

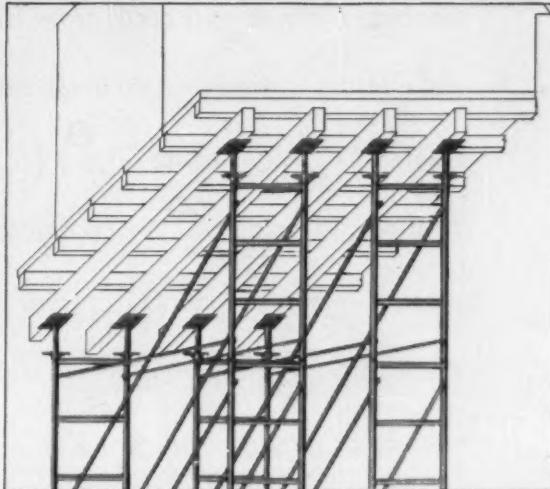
SAFWAY STEEL FRAME SCAFFOLD CUTS TIME AND MATERIAL COST

THIS 4 BY 6 FT. BEAM was shored with Safway steel scaffolding for faster handling, greater convenience, safety and lower ultimate cost. And overall savings amounted to about 60% of the cost of ordinary timber shoring, according to the M. De Matteo Construction Co., who handled the job.

Loads are carried on the tubular steel legs of the scaffolding, braced in two directions. Careful calculation established the number of scaffold frame legs and size of wood beams and joists required to support the concrete. Extended platforms made it easy for men to set and strip side forms.

Safway scaffolding goes up quickly, without tools. Screw jacks compensate for uneven ground and permit final leveling of formwork. As work progresses, complete shoring towers can be moved without disassembly. And the contractor recovers 100% of his scaffold equipment.

CONSULT SAFWAY ENGINEERS—Learn how you can cut shoring costs! Call your nearby Safway office for planning and erection service—ample stocks are available for *sale* or *rental*. Submit job details for recommendations (no obligation). And **WRITE TODAY** FOR BULLETIN 181.



Proper spacing of shoring columns is determined by total load and capacity of the lumber. Safway scaffold frames are available in a number of sizes to meet every spacing requirement, permitting beam loads to be carried directly on column legs rather than horizontals.

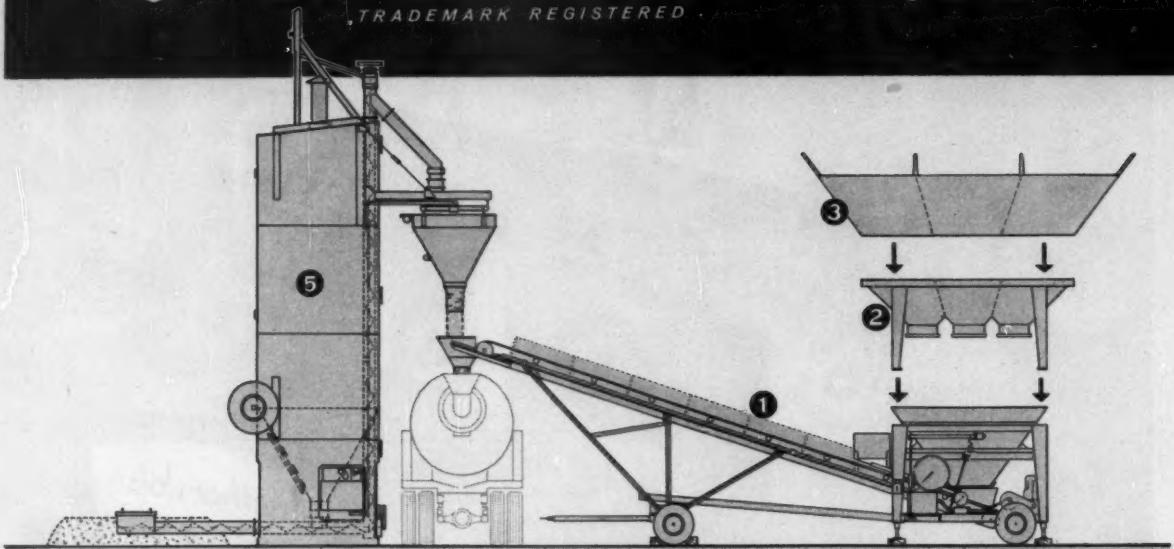
SAFWAY
STEEL PRODUCTS, INC.

6243 W. State St., Milwaukee 13, Wis.



BATCH-A-BOUT...biggest

TRADEMARK REGISTERED



Your investment in a **BATCH-A-BOUT** can be as modest as you care to make it.

With the basic components . . . the aggregate weigh batcher, batch transfer conveyor

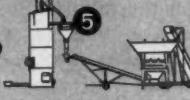
and sack cement loading hopper  . . . you can enlarge the plant later to

suit bigger jobs as your needs grow. In a step-by-step enlargement of the plant, you

can add the 12 ton capacity overhead aggregate bin-gate section which is still low

enough for scoop loading  ; bin top extension complete with heap plates

to 40 tons storage  ; portable aggregate bin loading conveyor  ;

portable automatic cement batcher and storage silo 

Plant output varying from 30 to 75 cubic yards per hour easily attained depending on equipment used.

Aggregate bin loading conveyor . . . may also be used as a portable stacker.



Receiving screws used as portable bulk cement transfer plant
for cement treated base.



money-maker in the field earns its way every day in many ways

Versatile BATCH-A-BOUT is more than a rugged, efficient cement and aggregate batching plant compact in size and cost. Its components can be used separately as a radial stacker or bulk cement transfer plant to reduce the costly investment in materials handling equipment.

Easily and economically transported to the job site on projects too small to warrant a NOBLE-MOBILE or stationary plant, BATCH-A-BOUT saves long transit-mix hauls and insures profit on marginal jobs.

With BATCH-A-BOUT, ready-mix producers test the potential of a new area, protect their business against competition during periods of peak demand, supply concrete on construction jobs far

beyond normal range. Lumber and building supply dealers meet the ready-mix requirements of their customers. BATCH-A-BOUT provides contractors with low cost concrete on building, bridge and highway work in remote areas.

BATCH-A-BOUT is engineered and built to the same standards of quality as NOBLE-MOBILE, NOBLE semi-portable or NOBLE stationary plants. Aggregates are weighed manually . . . cement automatically. Water is metered manually. With optional automatic graphic recorder for cement, BATCH-A-BOUT will comply with rigid governmental specifications on many projects. BATCH-A-BOUT can be towed by pickup, mixer, or dump truck. Meets highway transport regulations.



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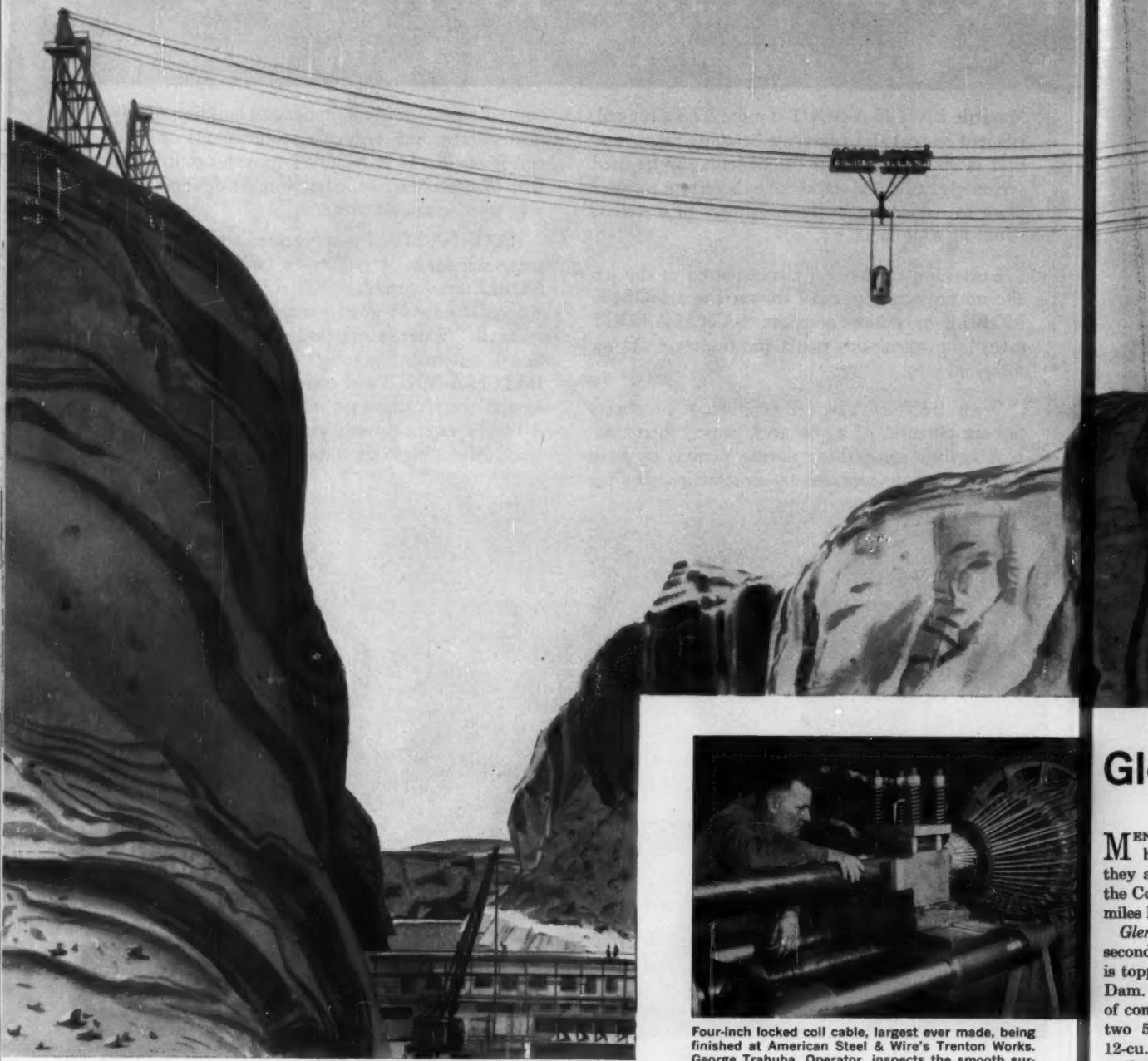
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Superhighways in the sky



Artist's conception of how the two Tiger Brand Cableways will be used in the construction of Glen Canyon Dam on the upper Colorado River. The higher cableway can pass over the lower one. Both can service all areas of the construction site.

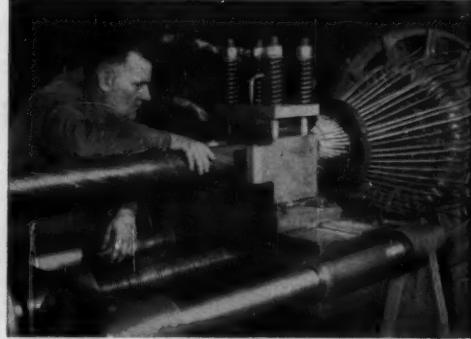
GLEN CANYON DAM

700 FEET HIGH—1400 FEET LONG

Second highest dam in the United States, located on the Colorado River in northeastern Arizona.

Ranks with the greatest dam projects ever undertaken and is a key feature of the U. S. Bureau of Reclamation's \$400-million Colorado River Storage Project.

- Reservoir capacity—28,040,000 acre feet with a lake 186 miles long.
- Power capacity—900,000 kw. in eight generators.
- Volume of concrete in dam proper—4,770,000 cu. yd.
- Contract for dam and power house—\$108 million, awarded to Merritt Chapman & Scott Corp.
- Cableway contractor: Kiewit-Judson Pacific Murphy Co.



Four-inch locked coil cable, largest ever made, being finished at American Steel & Wire's Trenton Works. George Trahuba, Operator, inspects the smooth surface of the cable which will support cableway buggies capable of handling 50 tons of construction material.

Perplexed porcupine, "Sticky," inspects short "broomed-out" length of the main cable made up of 312 steel wires. Over 145 tons of the cable have been made for the new dam's cableways.



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Columbia-Gen



Glen Canyon cableways... largest ever made!

Men look like midgets against the backdrop of Glen Canyon—but they are building a giant-size dam on the Colorado that will make a lake 186 miles long.

Glen Canyon will be the country's second highest dam. Its 700-foot height is topped only by the 726-foot Hoover Dam. It will require 4,770,000 cu. yds. of concrete which will be poured from two 50-ton-capacity cableways using 12-cu.-yd. buckets. This looks like an endless job, but these cableways really make speed. The contractor is aiming for an unprecedented rate of 9,000 cu. yd. daily—50% more than has previously been possible.

The track cable, or "main gut" as it is called by the dam builders, is the

largest ever built. It is a 4-inch-diameter USS Tiger Brand Locked Coil Cable built at the Trenton, N. J., plant of American Steel & Wire. It has a strength of 880 tons, weighs 38 pounds per foot, and operates at a tension of 640,000 pounds. Tiger Brand operating ropes of 1½-inch diameter will also be used on this equipment to safely convey, raise and lower the loads into position.

At the dam, one of the two cableways stretches 2,050 feet between two traveling towers on opposite sides of the Colorado River. The second 1800-foot cableway connects two shorter towers allowing the higher span to pass over the top. Working together, the cableways can place 100-ton loads such as large steel penstock sections. They can

handle work in any construction area at the dam.

Another Tiger Brand Cableway using a 3-inch cable 1,490 feet long is helping to build the Colorado River Bridge, the nation's highest and second longest steel arch span.

Tiger Brand Wire Rope is engineered to fit the job... engineered by one of the finest staffs in the country and backed by the basic research of the United States Steel Corporation. Next time you need wire rope, rig up with Tiger Brand. It will keep your machines on the job. Write American Steel & Wire, 614 Superior Avenue, N. W., Cleveland 13, Ohio.

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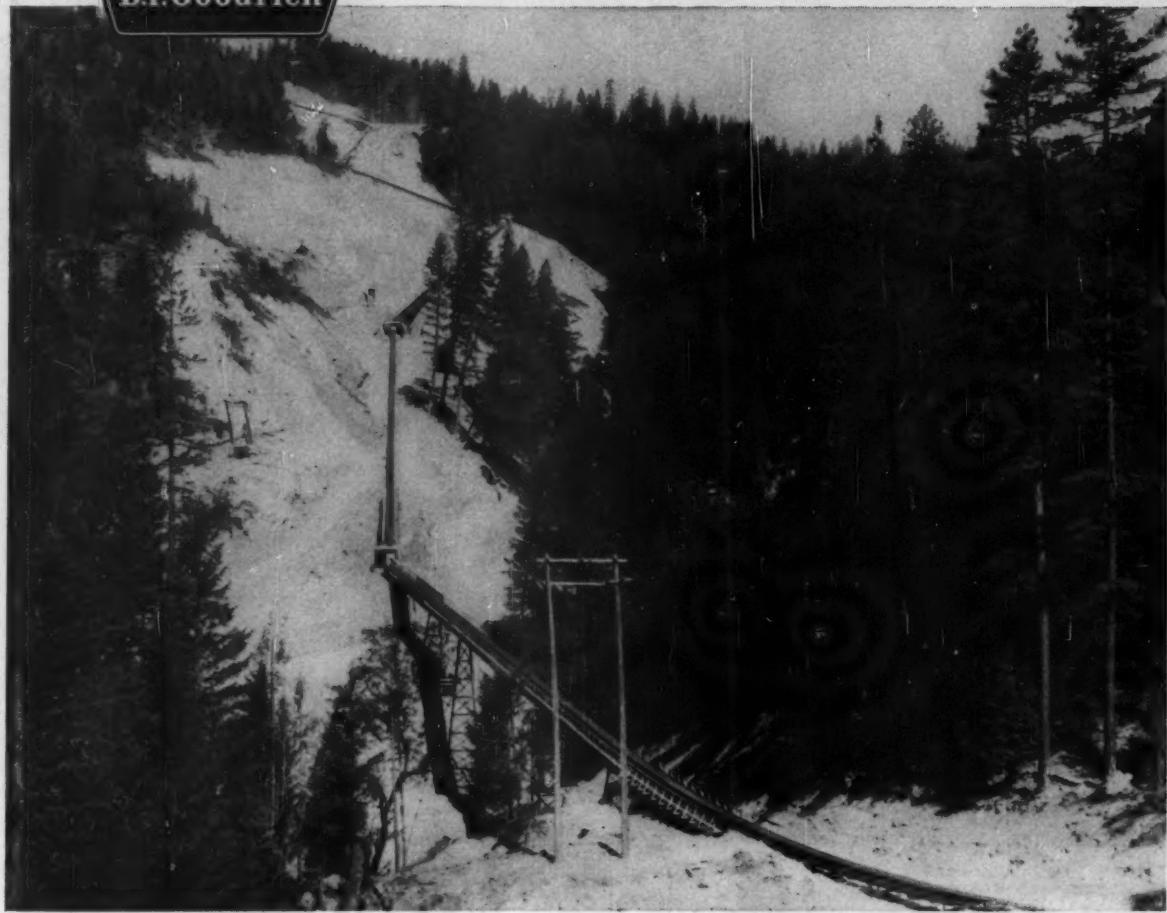


Photo by U.S. Bureau of Reclamation

Rubber builds a rock pile to hold back a river

B.F. Goodrich improvements in rubber brought extra savings

Problem: Millions of tons of gravel and clay will be carried two miles down that mountainside to build one of the world's largest earth-fill dams. Because of the heavy loads, only short lengths of ordinary conveyor belts could be used. But every extra transfer point where one belt dumps onto another adds to costs. They needed a belt strong enough to carry this "fill" from mountain top to the dam in just a few long hops.

What was done: Engineers recom-

mended that the gravel and clay be carried by a series of only nine B.F. Goodrich Nyfil conveyor belts—one of them nearly a mile long. In this belt, nylon is used as cross threads in the fabric to give extra flexibility and decrease weight. Belts made with Nyfil fabrics have greater impact resistance, can carry heavier loads farther than belts made with ordinary fabrics. Yet these stronger, longer-lasting belts cost no more.

Savings: On this construction job, the

number of transfer points was reduced almost to half by using B.F. Goodrich Nyfil belts. This means big cuts in construction, operation and maintenance costs. Almost 3000 tons per hour are carried by the nine B.F. Goodrich belts.

Where to buy: Your B.F. Goodrich distributor has full information on the conveyor belts described here. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F. Goodrich makes for industry. *B.F. Goodrich Industrial Products Co., Department M-505, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

Construction Methods

AND
EQUIPMENT

JANUARY, 1959

VOLUME 41 • NUMBER 1

HENRY T. PEREZ, Editor

Success in '59

THE YEAR 1958, at least in volume of contracts awarded, was a good one for constructors. The total of over \$19 billion was nearly 7% ahead of awards in 1957. As far as contractor profits were concerned, however, the year left something to be desired.

The year 1959 promises to be much the same. Over-all, contracts for new construction should increase 5%, to more than \$20 billion. But unless senseless, below-cost bidding and reckless gambling on "getting all the breaks" is stopped, the ranks of contractor failures will continue to swell.

This outlook applies particularly to the roadbuilder. Highway construction awards last year zoomed 25% over 1957 to reach \$4.4 billion. A 12% increase in 1959 should bring this year's total to \$4.9 billion. The American Road Builders Assn. also predicts a 12% rise in expenditures for highway construction this year, while the Associated General Contractors of America expects 15%.

The roadbulider's lot may be happier in other ways, too. Many state highway departments have reduced retained percentages, have adopted provisions for payment for materials delivered to the site, and have expedited final payments. Chances are that this trend will continue.

Chances are, too, that more states will revise their highway construction specifications along the lines of "end results" rather than spelling out the methods to be followed.

An AASHO-AGC joint cooperative committee has recommended that all highway departments adopt end-result specifications and eliminate from them the weasel phrase "or as directed by the engineer." The committee has also asked that a minimum three-week bid-advertising period become established practice. And it recommends that the states locate and acquire rights to borrow pits, then make them available to the successful bidder at cost.

As for the highway and heavy contractor's equipment and financial picture, there are hopes that beneficial revisions in the depreciation and salvage rules can be brought about. On the other hand, while they will do more work, new machines will cost more.

So will labor; rates can't go anywhere but up. And, despite efforts of union leaders, featherbedding and its attendant evils will still be with us.

It does not mean that we should not continue to fight them vigorously, but these are things we have had to live with for years. What could prove to be a more potent danger is the increase in absurd bidding practices by contractors themselves.

Men who profess to be businessmen as well as constructors continue to bid below cost, or at no profit, hoping for a miracle to bail them out. Well, there are few miracles in this business. Success does not come to the man who panics and cuts prices below cost when the volume of work on his books becomes low. But success will come to the contractor who first will figure out new ways to cut his costs, then bid accordingly.



An army of men and machines blast out and haul away between 30,000 and 40,000 yd of rock every day to prepare a base for the \$98-million Niagara Generating Plant, key unit in a \$700-million power project under construction at Niagara Falls, N.Y.

FROM ACROSS THE RIVER the cliffside resembles a series of high rock steps. They have 30-ft risers, and they climb to a height of more than 300 ft. At first the formation appears to be natural, but a closer look reveals what it really is—a product of men and machines.

Against that cliffside stairway will go the \$98-million Niagara Generating Plant, key unit in the \$700-million Niagara Power Project in Niagara Falls, N. Y.

Merritt-Chapman & Scott Corp. has been carving out the rock stairway since early March of last year. They are working under a tight schedule. They must move between 30,000 and 40,000 yd of rock daily from a work area little more than 300 ft high and 1,780 ft long to a spoil area two miles away. Total rock to be moved—nearly 8,500,000 yd along with 1,000,000 yd of overburden.

MC&S works night and day at

the task with a force that numbers 1,000 men, 80 trucks, 8 power shovels, and 24 drill rigs. How can so many men and machines work in so small an area? The answer lies in the stairway or benching set-up that provides, instead of one work platform, a whole system of work platforms joined by haul roads.

They might have started at the top and worked down in one platform. But that would have created a full-time job just cutting and recutting haul roads as excavation proceeded. And only a limited number of machines could work on the platform at one time. In addition, these haul roads would have been steep enough to challenge a mountain goat.

Benching out the rock creates seven or more work platforms on which men and machines can operate despite the limited overall area.

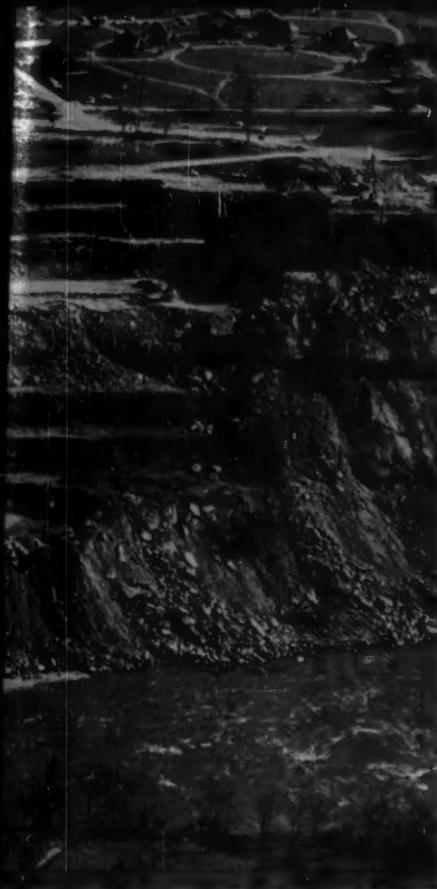
Big Fleet Stairway

Early in the job the first bench was cut out of the cliff's top edge to a depth of 30 ft and over an area roughly 100x100 ft. As widening and cutting back of this bench continued, a second bench was started down through the first to a depth of another 30 ft. As these benches progressed back from the cliff face, subsequent ones were started down the cliff's side.

These benches are connected with short ramps. They create a network of roads that permits free and easy traffic with little traffic control. Roads and ramps need only occasional reshaping and maintenance by a few graders and tractors.

On-site haul roads connect with either an upper or a lower haul road both of which lead to the spoil bank. There material is dumped to a height of 60 ft over an 26-acre area.

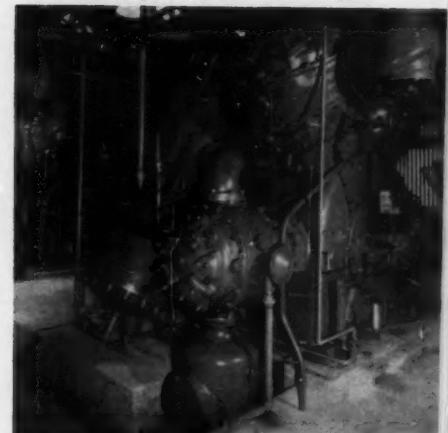
continued on page 60



Carves Up Rock Cliffside



ON SIDE OF CLIFF—Modified Ingersoll-Rand Drillmaster mounting four movable drill towers shoots line holes around perimeter of blast section. Between 100 and 150 holes pull apart 10,000 yd of rock per shot.



FROM TOP OF CLIFF—Pipeline carries compressed air for drills down side of cliff and over haul road. Pipeline is fitted with taps from which rigs take air. Three Joy WN-223 heavy-duty compressors, ordinarily thought of as stationary units, supply the air. Units are set on concrete foundations and housed in clifftop compressor building with one operating engineer.

Big Blast Fractures Rock



BLASTING—Electric detonation with 16 delays sends rock flying and opens bench.

When bench excavation reaches back to approximate foundation grade steps will be trimmed to make a raking, smooth cliff wall against which the concrete power house wall encasing steel penstocks will be poured.

It all sounds simple, but the project's immense size creates many job problems and forces innovations that make almost every phase of the rockmoving, from drilling to final dumping, noteworthy.

Drilling

Rock consists of equal quantities of dolomite, limestone and shale. To break it up, MC&S has at work a total of 24 drill rigs spotted at different locations on the benches. These rigs drill 3 to 4½-in. dia. holes 30 ft deep. Patterns vary but run on an average of 12x12 ft and 14x14 ft. One unusual feature of the drilling operation, however, is the compressor system that feeds air to the drills.

These are three Joy WN-223 heavy duty air compressors ordinarily thought of as stationary industrial units. MC&S has mounted them in a clifftop compressor house.

The three units deliver 9,600 cfm of air that help power all 24 of the drills on the job as well as other pneumatic equipment.

Compressed air flows through a pipe that varies from 10 to 8 in. as it follows the path of the benched-out haul roads. This pipeline, made up of short lengths of pipe, is fitted with taps



SCALING—Following a blast, scalers move down sheer wall of rock to remove loose material before shovels and trucks move in to begin excavation at the lower level.

from which drills and other equipment can take required air through flexible hose lateral lines.

Thus, drills easily can be moved from one bench to another and simply tap into the line for needed air. Pipe lengths are readily dismantled, moved and repositioned as excavation progresses.

Drills at work include seven Joy TM-500's; five Joy wagon drills with TM-400 units, and a Joy Trac-Drill with a TM-450 drill unit.

Other rigs include a McCarthy 106-8 Auger drill, a mining rig; and eight Gardner-Denvers—two RMC 128S rigs; four DH 123 J Boomtracks, and two HT 143's as well as smaller units.

An unusual rig on the job doing line drilling is a modified Ingersoll-Rand Drillmaster. This is fitted with a 25-ft carriage mounted on its side that carries four D-45 drills on 26½-ft towers. They take 20-ft steels. Vertical alignment of the drills comes by raising or lowering the four standard Drillmaster jacks with 48-in. strokes. I-R motors feed the drills, move the drill support along the frame, propel the crawler tracks that move the rig, and drive the hydraulic pump that actuates the jacks.

The rig is positioned within 3 ft of the line of holes being drilled. Once leveled the frame is shifted to the end of the carriage, drill guides are lowered, and drilling begins. Drills are shifted 9 in. as each set of four

holes is completed. This allows eight set-ups before repositioning of the rig is necessary.

Blasting

Between 100 to 150 holes are drilled to pull an average of 10,000 yd of rock per shot. The contractor maintains an average of five shots every three shifts.

Each hole is loaded with approximately 0.7 lb of powder for every yard of rock to be pulled. Explosives employed are DuPont Red Cross Extra 40% dynamite, DuPont Hi-Cap and Prime Explosives, and Atlas Amacor with both 60% and 40% gelatine content depending on the ruggedness of the rock. Detonation is by DuPont and Atlas electric blasting caps with 16 delays per shot.

Each type of rock fractures differently. Dolomite comes up light and well fractured while limestone comes up chunky. Shale on the other hand tends to pulverize. Each of these characteristics is playing its own peculiar brand of havoc on trucks doing the hauling.

Loading and Hauling

Round the clock a fleet of 80 trucks enters the excavation area, loads up with rock, and makes a 2-mi haul to the riverbank spoil site. The fleet consists of about an equal number of Euclid 12 and 15-yd trucks and International Harvester 12 and 15-yd Payhaulers.

At the start of a shift each truck is assigned to one of eight power shovels spotted on differ-



EXCAVATING—Working around the clock a Lima shovel loads rock into Euclid haul trucks to help maintain fantastic rock-moving schedule of up to 40,000 yd a day.

ent benches throughout the job. These include four Lima 2400's, two Marion 111-M8's, a P&H 1055, and a Bucyrus-Erie 54-B.

Each truck remains with its assigned shovel throughout the shift. In the event of breakdown or overcrowding at any shovel, the foreman in charge of the shovel redirects the trucks to another shovel after clearing the move with the truck foreman.

Flagmen are spotted at all haul-road intersections and at all benches where two or more shovels are at work. These flagmen control truck traffic.

Communication between foremen and flagmen is by Motorola two-way radio. The radio system consists of three base stations. One is located in the project manager's office, one at the telephone switchboard, and one in the equipment shop. Substations are located in all of the superintendents' and foremen's vehicles. All radio units operate on the same frequency.

But the rock, together with an ever-present mist caused by the nearby falls, prove formidable foes.

Rock that doesn't fracture finely chops chunks from the normally rugged truck tires and forces constant replacement. Easily fractured rock and shale grinds to powder under the pounding of the huge truck tires. This powder mixes with the mist to become an abrasive muck.

So terrific has the rock problem been in this respect that tire replacement costs so far have ex-

ceeded the \$500,000 mark.

B. F. Goodrich Co. holds a tire service and replacement contract with MC&S. Goodrich is taking advantage of the rough conditions to test on the contractor's machines, but at its own cost, some 60 experimental tires it has under development.

Another production drawback is that rock doesn't load trucks to their heaped capacities. A truck with a 15-yd capacity seldom can take more than about 12 pay yd of rock. But MC&S trucks never stop rolling. They clock something like 3,500 trips a day between the cliffside and the spoil area.

Trucks work continuously from shift to shift in relay-like fashion. Each truck finishes a shift heaped. A new driver takes over, dumps the load, then drives the truck through a "lube house" alongside the haul road. The lube house works something like a drive-in car wash. When the truck enters it, four mechanics armed with grease and oil hoses go to work. Within a minute, the truck goes back to work fully greased and oiled.

Nightwork

Darkness during the winter months comes early. At about 5 pm lights begin to go on. First they appear on the trucks, shovels, and tractors fitted with headlights. Later, a lighting system that a baseball park might be proud of floods the work area, the haul road and the spoil bank with light.

Big Machines Move Rock Away



HAULING — International-Harvester Pay-haulers haul rock to a spoil area 2 mi away.

Lighting for the excavation area comes from seven wood poles set atop the cliff and four supplementary steel towers on either side of the excavation. The wood poles each carry six 1,500-watt Steber and Crouse-Hinds incandescent and six 1,000-watt Crouse-Hinds and Circle mercury flood lights fed by a 240-volt, three-phase service.

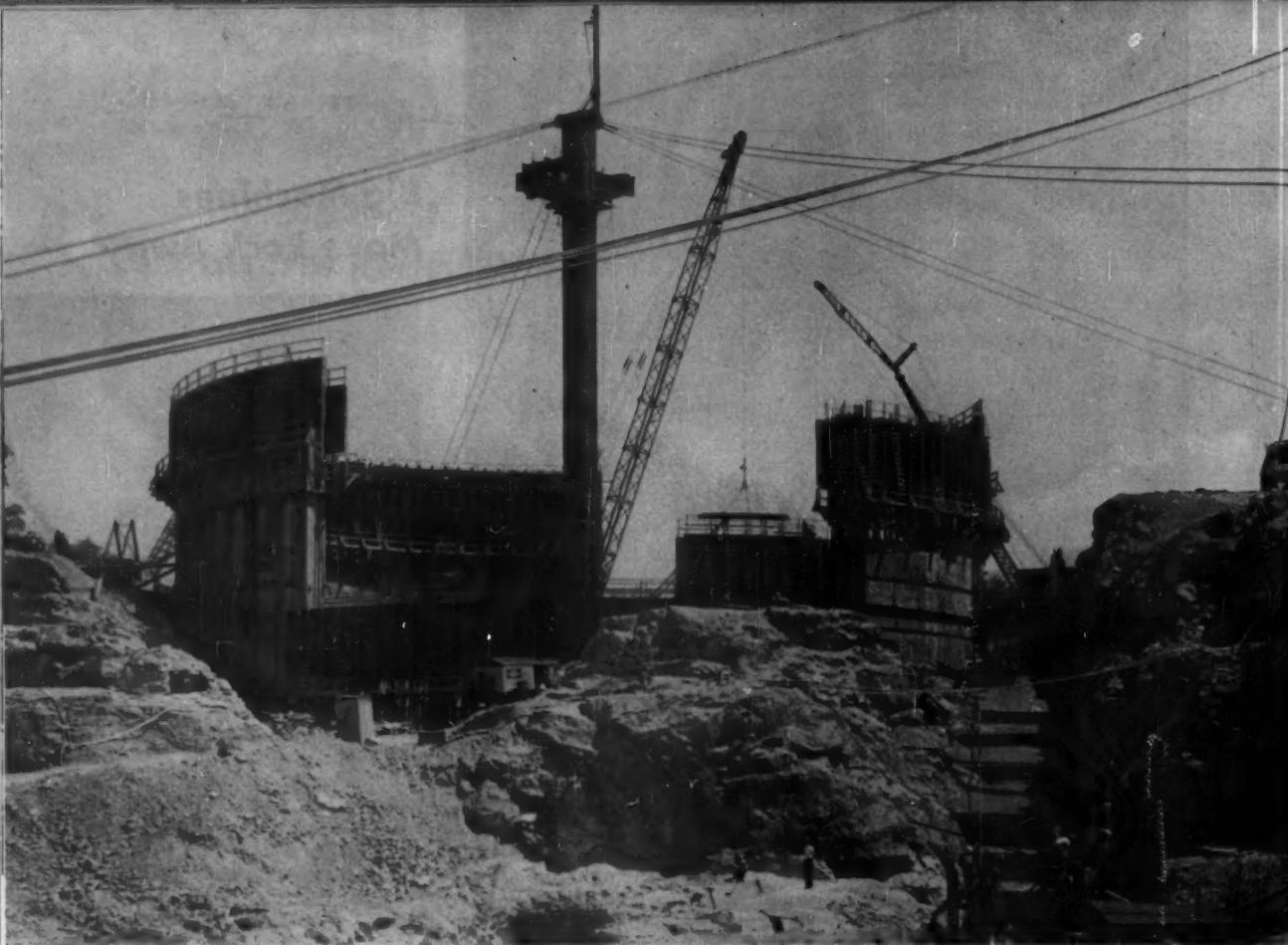
The 60-ft-high steel towers each carry a bank of twenty-four 1,500-watt incandescent and twenty-four 1,000-watt mercury flood lights. Primary power of 2,400-volts, three phase, is fed to each tower and reduced by transformers mounted on the tower to 240 volts, three phase.

MC&S needs only two small movable steel towers to light the area where trucks are dumping. When the dumping area is shifted the towers, too, are moved.

The haul road is illuminated by twenty-nine 400-watt General Electric mercury street lighting luminaires about 200 ft apart.

Some prices MC&S is getting for the work applicable to the rock-moving operation includes: \$2.65 per yd for rock excavation; \$0.75 per lineal ft for drilling line holes; \$2.50 per yd for drilling and broaching; and \$4.00 a yd for scaling of rock surfaces.

Construction is under the supervision of G. G. Werner, vice president. Key personnel on the job includes Herbert S. Booth, project manager; Elwin Simpson, general superintendent; and C. S. Mason, project engineer.



REACTOR SHIELD—A massive cylindrical wall encloses the 160-ft-dia steel sphere containing the nuclear reactor. Thickness of the wall varies from $5\frac{1}{2}$ to $7\frac{1}{2}$ ft.

Precast Units Form Dome

Precast half-arch rib sections, bracing struts, and heavy planks—in all 264 heavy concrete units weighing a total of 7,000 tons—fit together to form a self-supporting dome over the 180-ft-dia cylindrical housing of an atomic power reactor.

IT TAKES A LOT of concrete to house a nuclear reactor. Walsh Construction Co. of New York placed more than 10,000 cu yd of concrete in the thick cylindrical wall that encloses Consolidated Edison's nuclear power reactor at Indian Point, N.Y.

In addition, Walsh must cast and erect 264 heavy concrete units to form a self-supporting dome on top of the 180-ft-dia cylindrical tower. Altogether the dome sections will weigh more than 7,000 tons. Minimum thickness of the sections is $2\frac{3}{4}$ ft.

The 90-ft-high cylindrical wall varies in thickness from $5\frac{1}{2}$ ft at the bottom to $7\frac{1}{2}$ ft at the top,

where a 20-ft-deep prestressed ring girder runs around the circumference of the shield. Except for the ring girder, the structure—both wall and dome—is conventionally reinforced.

The cylinder is set in a circular pit blasted out of solid rock. Top of the footing is about 75 ft below initial grade. Inside the cylinder, a 45-ft-deep saucer scooped out of the bottom provides space for the lower part of a 160-ft dia steel sphere that contains the reactor. Poirier-McLane Corp. of New York did the excavation.

Three different types of precast sections—ribs, struts, and planks—will make up the dome. Twenty-

four curved ribs will spring from the cylindrical wall and meet, like the spokes of a wheel, at a compression ring at the center of the dome. Two $1\frac{1}{2}$ -ft-thick struts between adjoining ribs will provide lateral stability. The planks will fill in open spaces between the struts to complete the dome.

The compression ring at the center of the dome will be cast in place. Outside diameter of the ring will be 28 ft; inside diameter, 24 ft. Depth of the ring will be 5 ft. A $2\frac{3}{4}$ -ft-thick concrete plug, also cast in place, will cover the hole in the center.

Walsh is well along on precast-



CASTING YARD—Four lines of track service the yard. At one end, near the reactor enclosure, is the rib casting setup. Scattered along the tracks are 14 casting beds.

Over Atomic Reactor

ing the sections. They set up a yard at the site and began producing precast units last summer. Over half of the huge sections are now stored in the yard, ready for erection.

Each of the half-arch rib sections weighs 68 tons. The ribs vary in depth from 5 ft at the wall end to 4 ft at the other end where they fit into the compression ring at the center of the dome. Width of the ribs is 1½ ft at the top. A step juts from each side along the bottom, increasing the width there by 1 ft.

The planks are thick precast slabs. Eight of the planks fill in the gap, shaped like a slice of pie, between each pair of ribs. The planks are all 2½ ft thick, but they vary in width and length. In the row of planks along the outside edge of the dome, length is 20 ft. Planks in

the row nearest the compression ring, are only 2 ft long.

Wall Forming

As soon as the pit excavation was finished, Walsh started forming and pouring the walls. They used conventional timber formwork. Slip forms were out of the question for walls of such thickness.

The carpenters built 8x12-ft panels of ¾-in. plywood backed up with ribs and walers as the basic form units. Walers were double 2x8's on 4-ft centers. The curved 2x8-in. ribs molded the plywood sheets to the curvature of the cylinder. Sections of 2x8 bridging spaced the ribs at 1-ft vertical increments. Superior Cone-Fast coil ties held inside and outside panels together. Spacing was 4 ft horizontally, 3 ft vertically.

Thirty such panels, half on the inside and half on the outside, combined to form a wall segment equal to about one-fifth of the circumference of the cylinder. A 12-man crew handled the lifting and positioning of the panels. When the forming was going full blast, Walsh had a crew of 75 carpenters and laborers.

Concrete in the cylindrical wall was brought up in eight lifts averaging about 12 ft. The contractor completed a lift in each of the five segments about every 10 working days. After five to seven days, forms were stripped and reused in another segment. Most of the panels were reused seven or eight times.

Using a Manitowoc 3900 crawler crane with a 2-yd bucket, Walsh placed more than 10,000 yd of concrete in the wall in a little over three months.

Casting Dome Sections

Erection of the precast dome won't start until Chicago Bridge & Iron Co. finishes the steel containment sphere inside the cylinder. Completion of the sphere isn't scheduled until early next summer. But Walsh set up their casting yard and began casting the dome sections last September, giving themselves almost a year to get the units ready.

Four lines of 30-in.-gage track service the yard. They run parallel, spaced 30-ft apart along the 500-ft length of the yard. Scattered between the tracks at irregular intervals are casting beds for the various sizes of planks and struts for the dome.

There are two casting beds each for four of the eight different size planks, just one apiece for the other four. Two more 4-in.-thick concrete slabs form beds for the two types of struts that will brace the ribs. Each of the 14 beds has a steel bottom form.

Sections remain on the beds for two weeks after pouring, but side forms can be stripped after only two days. So one set of steel side forms for each of the 10 different shapes is enough.

At one end of the yard, about 100 ft from the cylindrical wall, is rib casting layout. Walsh set up three soffit forms on timber falsework between the outside lines of track. Two sets of bulkheads are enough to keep output at a steady pace.

Reinforcing is prefabricated at the site in three sections. It takes

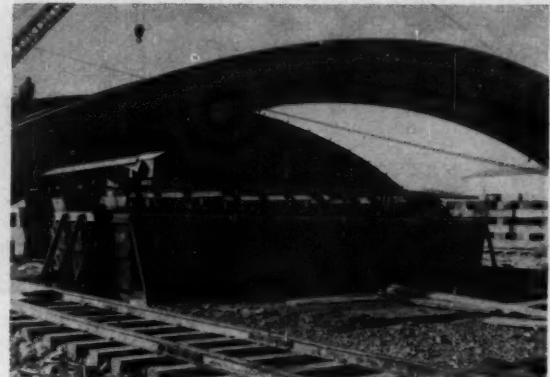


REINFORCING—Steel workers prefabricate the reinforcing for the giant ribs in three sections to speed placing of steel in forms.

Placing the reinforcing takes about one day. Then workmen bolt steel bulkheads to sides of soffit forms to prepare ribs for concreting.



MOVING THE RIBS—Two dollies—one at each end—lift the ribs from the forms and move them a few feet to the storage area.



CASTING BEDS—Steel side forms for the planks and struts are stripped two days after concreting. Sections remain on beds 14 days.

PRECAST UNITS FORM DOME . . . continued

the lather crew at least a day to place the cages in the forms. Then the bulkheads are moved into position on the sides, and the rib is ready for concreting.

Concreting only takes a couple of hours. A crane with a 2-*yd* bucket—the same rig used in pouring the cylindrical wall—places the ready-mix concrete in the forms. Curing period is 14 days, but side forms are stripped two days after pouring. Output is three ribs every 17 days.

Two specially designed dollies move all types of precast sections from the casting beds to a storage area. Each dolly is equipped with two 20-ton Simplex hydraulic jacks for lifting the sections from the beds. A 5-ton hand crab winches each dolly along the tracks. A crane can pick up a dolly and move it from one line of track to another when transfer

is necessary. Occasionally, when a crane is free, it will pull the dollies along with its hoist line, relieving the yard crew of the job of cranking the winch.

The contractor considered adding a small engine to power the dollies, but decided against it because of the extra expense of hiring operators for them. As it is, the union does not require special operators for the dollies. Any member of the yard crew can handle them.

The dollies work in pairs to strip casting beds for the planks and struts. Each carries one end of a lifting beam that spans the casting beds between two sets of tracks. Wire rope slings loop over the beam and pass through lifting eyes cast in the concrete units to hold them suspended beneath the beam.

The lifting beam is mounted on

a steel frame over the two jacks on the dolly so that it can be raised by jacking to provide the necessary vertical clearance over the casting beds.

To move the giant ribs, the contractor bolts a steel frame to each end, moves a dolly under the frame, and jacks the rib up out of the casting bed. Storage area for the 68-ton rib sections is only a few feet from the casting beds, but handling the big units is tricky. The two little dollies seem to balance the out-size half-arch sections as precariously as a beach ball on the nose of a seal. But in reality there is little danger that the rib will topple over.

The man in charge of the casting yard operation, Bob King, explains how they avoid mishaps:

"We have a telephone hook-up between the two ends of the rib



RIB FORMS—Welders put finishing touches on reinforcing cages. Contractor set up three rib soffit forms on timber falsework spanning between the outside rows of track.

to help the crew in guiding the movement. The men check the progress with a steel tape stretched along the track. They call off the distance moved inch by inch as they crank the carriages along the tracks. If one end gets even as little as 1 in. ahead of the other, the crew at that end holds up until the other gang catches up.

"Lifting the ribs clear of the soffit form is also a tricky operation. We raise the ends with the 20-ton jacks mounted on the dollies. For the rib to clear the form by about $\frac{3}{8}$ in. at the top, we have to jack up each end $2\frac{1}{2}$ in. because of the deflection of the rib as it comes free. We do the jacking very gradually, alternating from one end to the other.

"The thick end of the rib, the end that will be seated on the cylindrical wall, is much heavier

than the other so there is a decided tendency for the heavy end to push out as the rib comes free of the forms. A workman stationed up on top at the center of the rib checks the lateral movement by holding a plumb bob on the centerline of the rib and watching a corresponding line marked on the form. When the rib slides over $\frac{1}{8}$ in., we bring it back to exact center by jacking."

Operations in the casting yard are at a standstill now. Walsh plans to suspend operations completely until spring. Thus they'll avoid the complications of a large-scale winter concreting job.

When they start erection of the precast sections next summer, Walsh will use the same 100-ton stiffleg derrick that Chicago Bridge & Iron is now using to put the steel containment sphere inside the cylinder. The rig stands

on a stout tubular steel tower that extends up through the center of the sphere to a few feet above final crown elevation of the dome.

Plans for the erection of the precast units are already drawn up—well in advance, like everything on this job. But before raising the huge pieces into place, Walsh will first have to move them close enough to the cylinder for the derrick to reach out with its 135-ft boom and pick them up. To do this, they'll have to extend the tracks in the casting yard up to the side of the shield. And that means a substantial earthmoving operation to fill in the deep gully around the sides of the reactor enclosure.

The erection sequence will be ribs first, then struts, and finally planks. The derrick will place four ribs, two on each side of the dome, then add the two struts bracing each pair of ribs. Next four ribs will go in at right angles to the first group, and so on around the circle.

Before placing the planks in the gaps between ribs, the crew will pour the compression ring and grout the pockets in the wall that holds the ends of the ribs in place.

A steel collar around the top of the tower supporting the derrick will hold the forms for the compression ring, as well as the inner end of the ribs, until the dome is complete and self-supporting.

Next the erection crew will place the planks, one row at a time, starting at the outside of the dome and jumping from one side to the other to balance the load. Steps cast into both sides of the ribs will hold the planks in position. Similar steps cast in the sides of the planks and struts will key them together. The 1-in. gap between each row of planks will later be filled with grout and sealed with a strip of rubber waterproofing.

Final step in dome construction will be dismantling of the stiffleg derrick and pouring the concrete plug that covers the hole at the center.

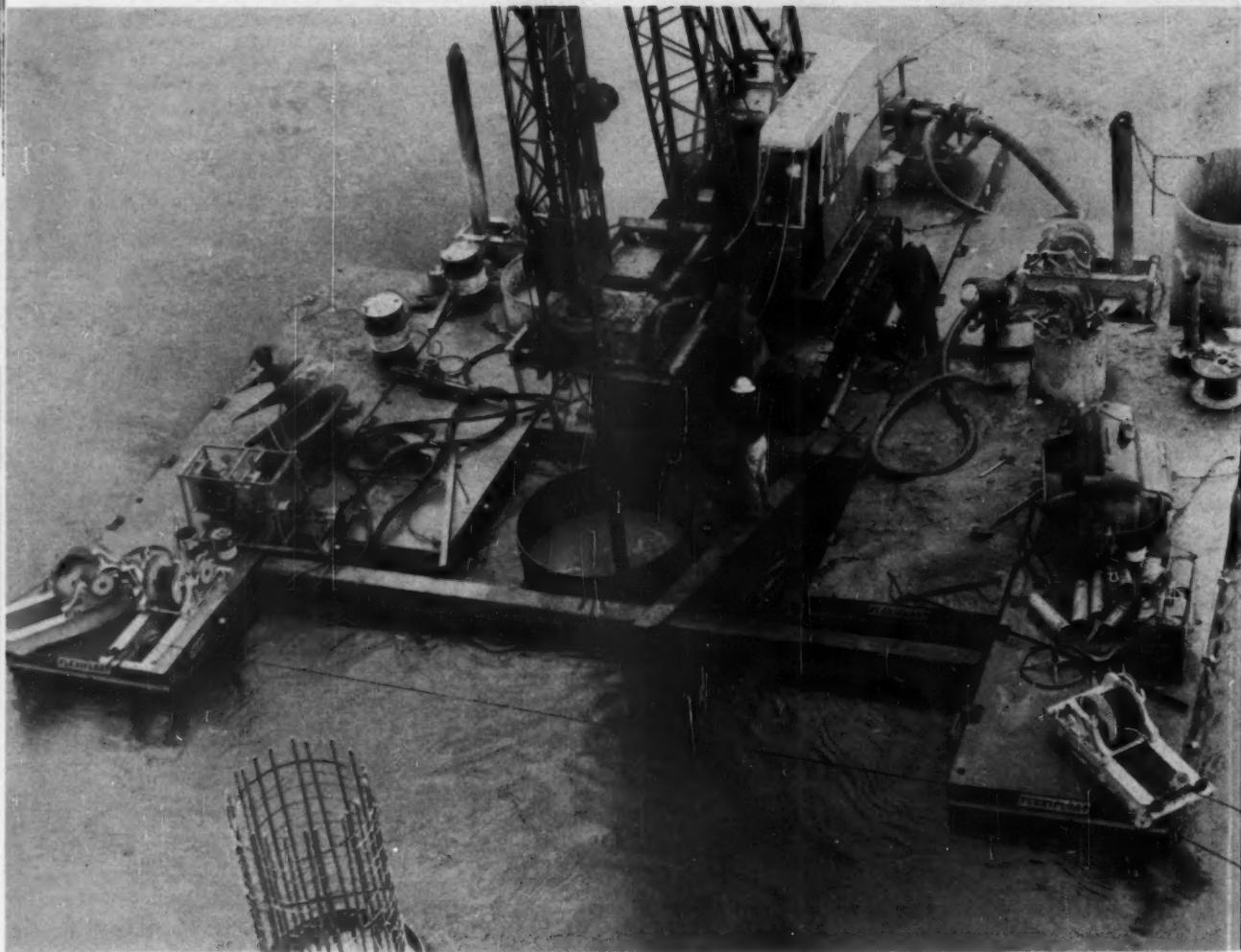
Superintendent David Cowger will return to the job in the spring to make sure everything is ready for the critical erection operation. While he was away this winter, Bob King took charge of all casting at the site. Project engineer Norm Wild laid out the plans for all phases of the job.



IN POSITION—Four winches, one at each corner, with two spuds, position barge.

Six small interlocking barges form a large platform that carries heavy drilling equipment. The crane-handled drill sinks 60-in.-dia shafts in the bottom of the Red River at Denison, Tex., to serve as foundations for the bridge's concrete piers.

Small Barges Float



TAILOR MADE—By fashioning six small Flexifloats into a Y shape, contractor creates barge that fits around shaft being drilled, providing workmen easy access to equipment.

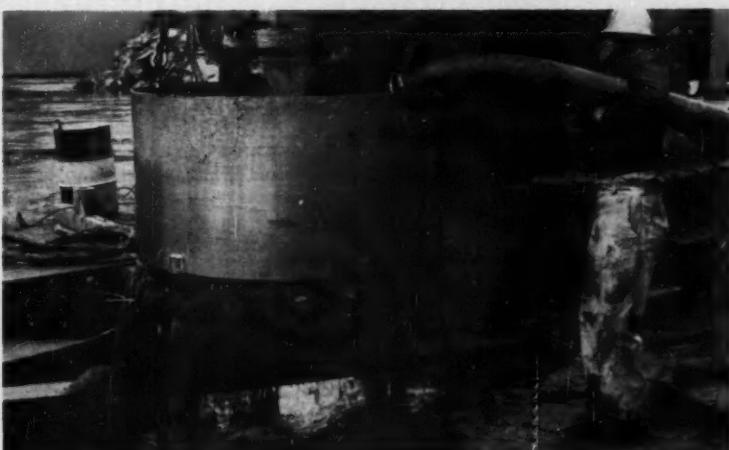


DRILLING—As drill bores through rock 20 to 30 psi of water flushes fine cuttings up from the hole. An 8-in. pump mounted on barge delivers the water at rate of 1,500 gpm.

Big Drill Rig



MUCKING—Larger particles of rock are brought up from hole in steel calyx basket attached to the 60-in. Hughes rotary bit that drills shafts 25 ft into bedrock.



FLUSHING—Calyx is raised and large cuttings are flushed by water from drill and calyx basket. Cuttings are dumped into the river alongside the protective 7-ft surface pipe.

SMALL PORTABLE BARGES that interlock to make a big barge of almost any desired shape help place foundations for a \$412,000 bridge over the Red River near Denison, Tex.

Contractor Harry Newton, Inc., of Graham, Tex., had to sink a number of 60-in.-dia shafts to support piers for the bridge, located just below Lake Texoma Dam. Placing them involved mucking and drilling down steel casings on 24-ft centers through overburden and bedrock, filling the shells with concrete, then pulling the steel casings.

To do the job, Newton devised a smart method that involved mounting drilling and other equipment on small interlocking barges previously assembled into one big unit.

The Flexifloat, as the small barge is called, was designed by Robishaw Engineering Co. of Houston and measures 7½x30 ft. Six of these were brought overland to the bridge site. Newton clustered them together into a Y shape on which they mounted all the equipment necessary for constructing the foundations.

In operation, steel cables and two steel spuds anchor the barge cluster in position. Beebe 5-ton winches at each corner reposition the cluster and raise and lower spuds. Cables that actuate spuds run through sheaves on the barge deck and down to the spud bottoms. Winches can be either hand operated or worked by electric motors run off a portable generator.

The unusual shape of the barge cluster simplifies drilling and casing driving. To sink a 60-in. drill shaft, Newton mounts a 25-ton Lima crane on the barge assembly. For drilling, the crane is fitted with an Ideco rotary table and power unit.

The contractor positions the barge so that the yoke of the Y opens over the drilling location and the crane goes to work.

First it lowers a 7-ft-dia outer shell, or surface pipe, into the water. This penetrates the 5 ft of silt overburden and toes into the bedrock slightly to serve as a protective shell. Then the crane, mounting an auger-type drill, mucks the silt from inside the shell to rock.

Next, a 60-in. Hughes rotary roller cone bit—similar to those employed in oil well drilling—is substituted for the auger. This bores a few feet through frac-

SMALL BARGES FLOAT BIG DRILL RIG... continued



CONCRETING—Concrete is delivered down into unwatered casing through a tremie pipe to avoid segregation. Bucket is handled by the barge-mounted crawler crane.

tured and fissured rock and shale until a solid shale is reached. Drilling then stops.

The drill is retracted and a 60-in. steel casing is lowered into the hole until it comes to rest on the seat of shale. The rock drill again continues drilling until the specified depth of 25 ft in bedrock is reached.

Water, delivered at a rate of 20 to 30 psi, flushes the cuttings from the hole. An 8-in. pump delivers the water at a rate of 1,500 gpm.

But this action flushes out only the smaller particles. Larger particles move towards the surface but, as pressure is reduced, fall back to the bottom.

The rotary bit, which comes fitted with a steel calyx basket, just above the roller cones, brings these particles to the surface. There the wall of the basket is raised and grindings are removed by flushing the basket with water under pressure.

Once full depth in the rock is

reached, the casing is wedged tighter into the hole to seal off the water. The shaft then is unwatered and readied for concreting.

A basket of reinforcing steel is lowered into the core. This consists of 22 vertical bars tied together with No. 3 steel spirals on a 6-in. pitch. A sheet of corrugated sheet metal encircles the reinforcing cage so that when it is lowered into the boring 3 ft of the sheet sets below the bedrock grade while about 13 ft sets above bedrock. About 1-ft of the corrugated sheeting protrudes above the surface of the water. The corrugated cage covering fits within the dia of the steel casing and serves as a form for the concrete shaft.

The shaft then is filled with a 3,000-psi, five-sack concrete placed by bottom dump bucket through a tremie pipe. Purpose of the tremie pipe in the unwatered casing is to prevent concrete from segregating. Concrete is ferried to the site in buckets by a motor-powered barge—not one of the portable ones.

After concreting, about 3 ft of sand is poured between the protective 7-ft-dia protective shield and the 60-in. steel casing. This sand plays a dramatic role in the final stages of the construction.

The corrugated sheet remains in place when the steel casing is recovered. The sheet has a smaller diameter than the hole in which it rests. This creates a possible blow-out point at the junction between the rock and silt area. Pouring sand over this junction creates a plug that prevents concrete from blowing out when the casing is retracted.

Barges also play an important role in placing superstructure steel for the 28-ft-wide bridge. Four barges are locked together. Dollies walk beams out to the crane. The crane picks them up and sets them into place.

Steel for the bridge consists of four lines of 36-in. WF beams and four lines of plate girders 60 in. deep. Connections are made by electric welding. No rivets at all are employed. Though the extra heavy girders eliminate overhead trusses, their massiveness demands close check of the welds. Proper welds are insured by X-raying every joint as it is made.

Frank Perrin is job superintendent.

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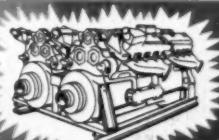
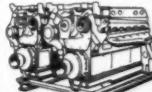
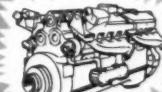
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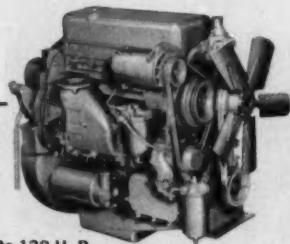
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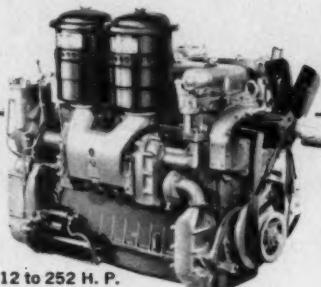
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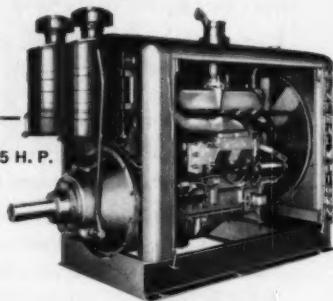
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Litho U.S.A.

Asphalt plays two roles on this Pennsylvania highway



Constructing a heavy-duty hot-mix Texaco Asphaltic Concrete pavement on 10 miles of State Route 22, near Harrisburg, Pa. General Contractor—N. Garman and Sons, Reading, Pa. Paving Contractor—Windsor Service, Inc., Reading.

The Pennsylvania Highway Department completed one of its largest Asphalt projects to date on a 10-mile section of State Route 22 near Harrisburg.

Texaco Asphalt, which was used exclusively by the contractors in this work, performed a double function. It was used both to underseal and to resurface the old rigid pavement originally constructed on the highway.

Approximately 2,000 tons of a relatively hard Texaco Asphalt was pumped through holes drilled into the old pavement, filling all cavities formed by subgrade settlement.

This was followed by a heavy-duty hot-mix Texaco Asphaltic Concrete surface, constructed in two courses on top of the existing slab. Approximately 60,000 tons of Asphalt mix were required.

From Pennsylvania to the Rockies, road builders have been paving with Texaco Asphalt for well over half a century. Whether traffic calls for a heavy-duty pavement or an inexpensive surface-treatment, there is a type of Texaco Asphalt construction to fit the need. Helpful information on all of these types is supplied in two brochures. Write for copies.

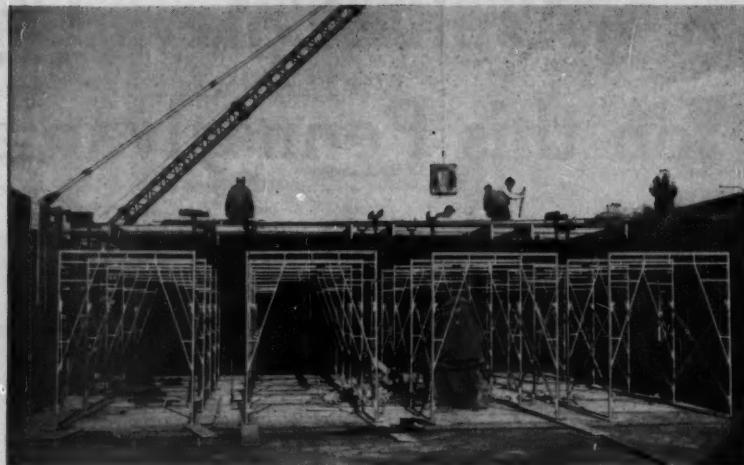
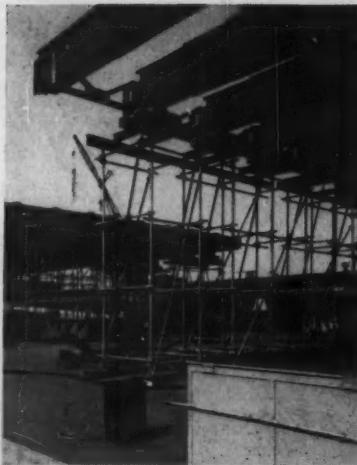
THE TEXAS COMPANY, Asphalt Sales Div., 135 E. 42nd Street, New York City 17
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TEXACO ASPHALT

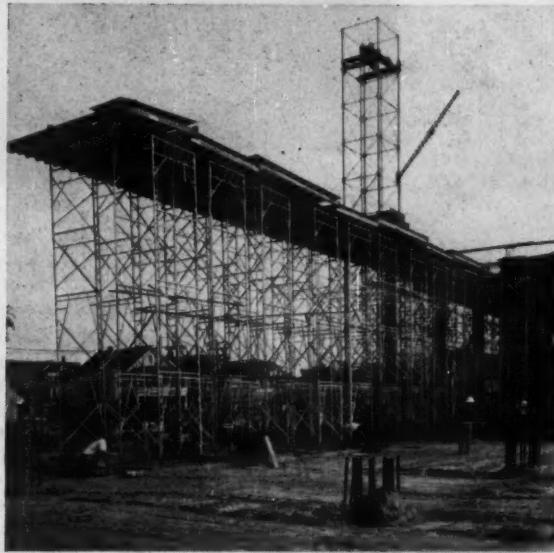
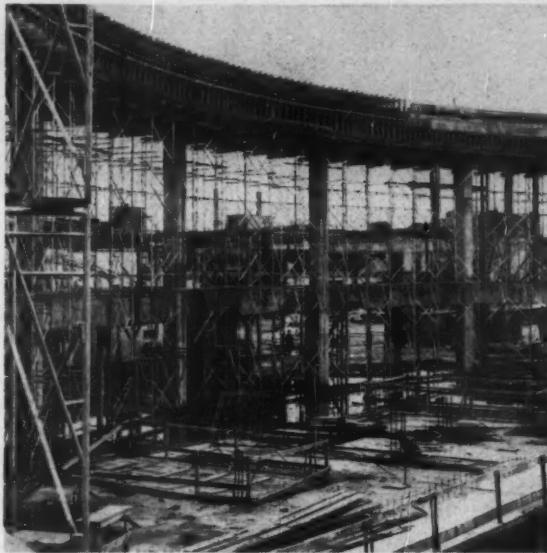
Shoring Methods . . .

by Patent Scaffolding Co.



CUTS COSTS 20%—"TubeLox"® Steel Shoring "towers" permit setting several dozen steel girders a day on overpass in downtown St. Louis. Instead of setting and riveting one girder at a time, thereby making iron workers dependent upon movement of cranes, St. Louis Steel Erection Co. keeps workers on the job, eliminates lost motion, and cuts working days by 20%.

NEAT, QUICK ROOF SLAB SHORING—Simple, easy-to-erect frames of "Trouble Saver"® Sectional Steel Shoring are rapidly set in place to support the formwork for the slab roof of the new Southwest Acres School, Thompsonville, Conn. Only 700 6'6"-high frames are required. Spaced 7' apart with 3' to 4' spacing between rows, these "Trouble Saver" Shoring frames adequately support all the load encountered. Notice how the free standing sections are neatly arranged ready for the placement of forming lumber. U-heads placed in the tops of the scaffolding frames are designed to hold the wood stringers. 20' adjustable leg attachments provide the precision shoring height required. Detailed layouts, supplied by PS Co., make assembly on the job site quick and easy. John Romano Contractors, general contractor.



SUPPORTS 3165 LBS. PER FOOT—Here, "Trouble Saver" Sectional Steel Shoring components are shown arranged to support a 242' diameter concrete beam, 47' above ground. Beam is 5'8" wide, with irregular depth to 4'6". While the height to which this shoring is erected is interesting, the major importance is the fact that it is assembled to carry a load of 3165 lbs. per lineal foot of beam. Utica (NY) Memorial Auditorium. Sovereign Construction Co., Ltd., general contractor.

SLIDING SYSTEM FOR MINIMUM EQUIPMENT—To gain the substantial cost advantages of minimum equipment, Frank Briscoe Co., Inc., here uses sectionalized set-ups of "Trouble Saver" Shoring which can be slid from pour to pour for the 8' floor slab of the new 250' by 275' Western Electric Co. Bldg. Boston. 22' x 125' shoring sections, with forms and dropheds in place, are slid forward between columns by cables attached to wood sills. Bulldozer used for power. Photo shows one narrower section just after movement.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



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Please send me a copy of the "Hazard Warning Lighting" manual.

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Go **DIETZ** and you go Safely



ONE JOB FINISHED—Jacks on traveler lower form 5 ft to clear road slab and girders. Then winch pulls traveler and forms from under slab and onto track-riding carriage.

Steel Forms Work With Novel Traveler

THREE SETS of steel forms fitted with shores and a traveler that handles them are speeding construction of a concrete roadway atop an overbank control dam at Simmesport, La.

The road, part of the \$47-million Old River Control Project, consists of a 6-in.-thick reinforced concrete slab 26 ft wide supported by concrete girders 5 ft deep. The girders span a long series of concrete piers set on 46-ft centers.

Specifications require that the contractor, F&C Engineering Co. of Houston, Tex., pour slabs and girders monolithically. To do the job fast and economically the contractor has this forming set-up at work.

The system consists of three sets of Blaw-Knox forms and shore units with a single traveler to handle them. Each form weighs 10 tons and measures 32x46 ft. It is fabricated to permit the pouring of a full bay.

A permanent shore is fitted to each form. The shore primarily is made up of eight lightweight steel "Y" frames set in two parallel rows of four frames each. Lower legs of the "Y's" telescope up and down between the raking upper legs. Bolts hold them in place when they are either in the extended or retracted position. The foot of each lower leg is fitted with a small screw jack that adjusts to minor variations in ground level.

Four H-beam stringers are welded in parallel rows to the upper legs of the "Y's". Welded on these are four H-beam joists. The steel form is welded over the joists. Lower legs of the shore are extended, and bolted to set the form for a pour. The screw jacks at the bottoms of the "Y" frames are adjusted to bring the form to exact grade.

The traveler basically consists of four vertical steel posts rigidly connected by steel angles. Each

post is fitted on top with a screw jack capable of a 6-ft rise and at the bottom with a double-flanged steel wheel.

Two tracks are run in under a bay of the roadway. A winch then pulls the traveler in under the form. Next, workmen go around each "Y" frame leg and retract the telescoping legs.

Jacks on top the traveler posts then retract, lowering the form 5 ft—enough to clear the girder soffits. The winch pulls the traveler holding the form and shore free of the poured deck and out into the dam's stilling basin area. There, the traveler moves up on a carriage on a second pair of tracks. These tracks run parallel to the road under construction—at right angles to tracks that run under the roadway.

A tractor then pushes the traveler and forms to the next bay to be poured. There, once more, a set of tracks is run in under the road, and the set-up is transferred off the carriage and into pouring position.

Screw jacks on top the posts push the form upward while workmen extend the "Y" frame legs and bolt them secure. Fine adjustments in the screw jacks at each leg bottom bring the form to exact grade. Once traveler jacks are retracted the form again is ready for a pour.

F&C employs a 10-man crew to handle forms and traveler. These consist of a traveler operator, two helpers and a surveyor to guide form and traveler movement plus six workmen to align forms, handle concrete, and do other miscellaneous work. Phillip Panzica is job superintendent.



ROLL TO ANOTHER—Form assembly and traveler ride on carriage to next bay.

ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL

FIRM C. H. LAWSON, INC.

Using RPM DELO Oil heavy-duty engines outlast equipment



C. H. Lawson, Inc. operates 78 pieces of road building equipment ranging from new to 15 years old, all using RPM DELO Oil. Only one engine has ever required major overhaul and that was not due to lubrication. Firm's chief mechanic, E. C. Miller, says,

"RPM DELO Oil has been used exclusively in all our heavy duty engines since 1944. In many cases, it has enabled engines to outlast the equipment." Euclid Earth Mover (above) gets a push from a bulldozer to provide extra traction in wet earth.



TD 24 International (left), one of firm's 12 bulldozers, helps clear the way for a Route 50 by-pass at Riverdale, Maryland. This two year old tractor has operated more than 4,000 hours without engine repairs. Company owner, C. H. Lawson (right), reports that RPM DELO

Oil keeps the engines in his equipment in such good shape that—regardless of operating conditions—they average approximately 4 years or 10,000 hours service before even minor repairs are required.



Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming



For More Information or the name of your nearest distributor, write or call any of the companies listed below.



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REG. U.S. PAT. OFF.

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THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso

THE CALIFORNIA COMPANY, Denver 1, Colorado



NEW DW20

Series G

NEW No. 456

Series B

NEW HP —345 (maximum output)—increased 8%

NEW RIMPULL —39,565 lb. (maximum)—increased 12%

NEW SPEEDS —increased rimpull—provides up to 20% faster travel speeds under normal haul road conditions

NEW CAPACITY—19.5 cu. yd. (struck)—increased 8%

27 cu. yd. (heaped)—increased 8%

NEW DW21

Series G

NEW No. 470

Series B

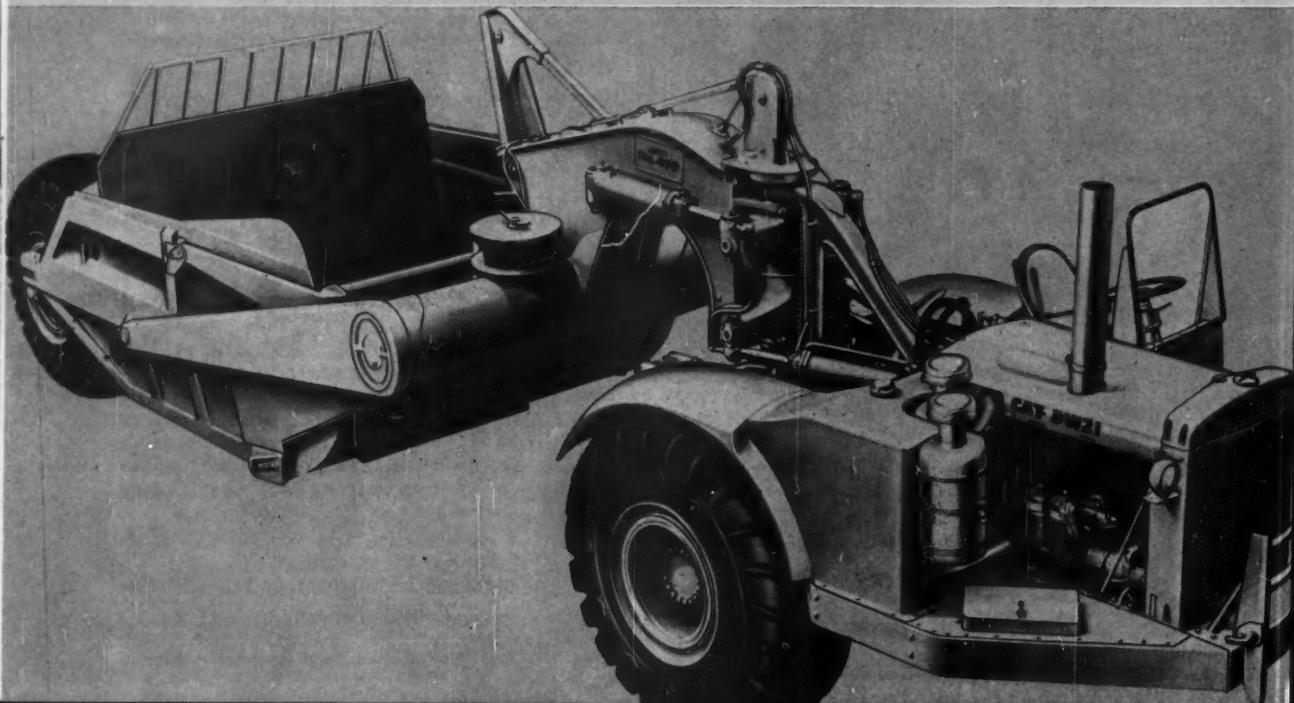
NEW HP —345 (maximum output)—increased 8%

NEW RIMPULL —49,100 lb. (maximum)—increased 12%

NEW SPEEDS —increased rimpull—provides up to 20% faster travel speeds under normal haul road conditions

NEW CAPACITY—19.5 cu. yd. (struck)—increased 8%

27 cu. yd. (heaped)—increased 8%



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PROJECT PAYDIRT* pays off for you

NEW CAT DW20 and DW21 SERIES G TRACTORS NOW 345 HP

*—plus new high-capacity LOWBOWL Scrapers
for faster cycles and higher production!*

For down-to-earth facts about these big new Caterpillar rigs, take a look at the box scores shown here. They summarize important increases in horsepower, rimpull, speeds, scraper ratings and tire capacities that pay off for you *on the job* with faster cycles, greater production and more profit!

Note* that the increased HP of the DW20 and DW21 Series G, compared with the models they're replacing, gives 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, this horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics inherent in the Cat Super-Turbo Engine. Torque rise of the engine in the Series G models is unequaled in the earthmoving industry.

In addition to the advantages featured in the box

scores, the new Series G Tractors and their matching LOWBOWL Scrapers deliver the *proved* reliability of Caterpillar-built machines. To handle increased horsepower and increased capacity, both have been improved in design and structure. The tractors, for example, have stronger final drive gears and improved transmission shifter forks. The scrapers have stronger bowls, push frames, draft frames and aprons. All these and other improvements result in better service life, less maintenance and lower cost dirt.

Here are modern, heavy-duty wheel rigs geared to the needs of today's highly competitive market—rigs that meet your requirements for moving more dirt at lower cost than ever. Get the complete facts about them from your Caterpillar Dealer. Call him today and set a date for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

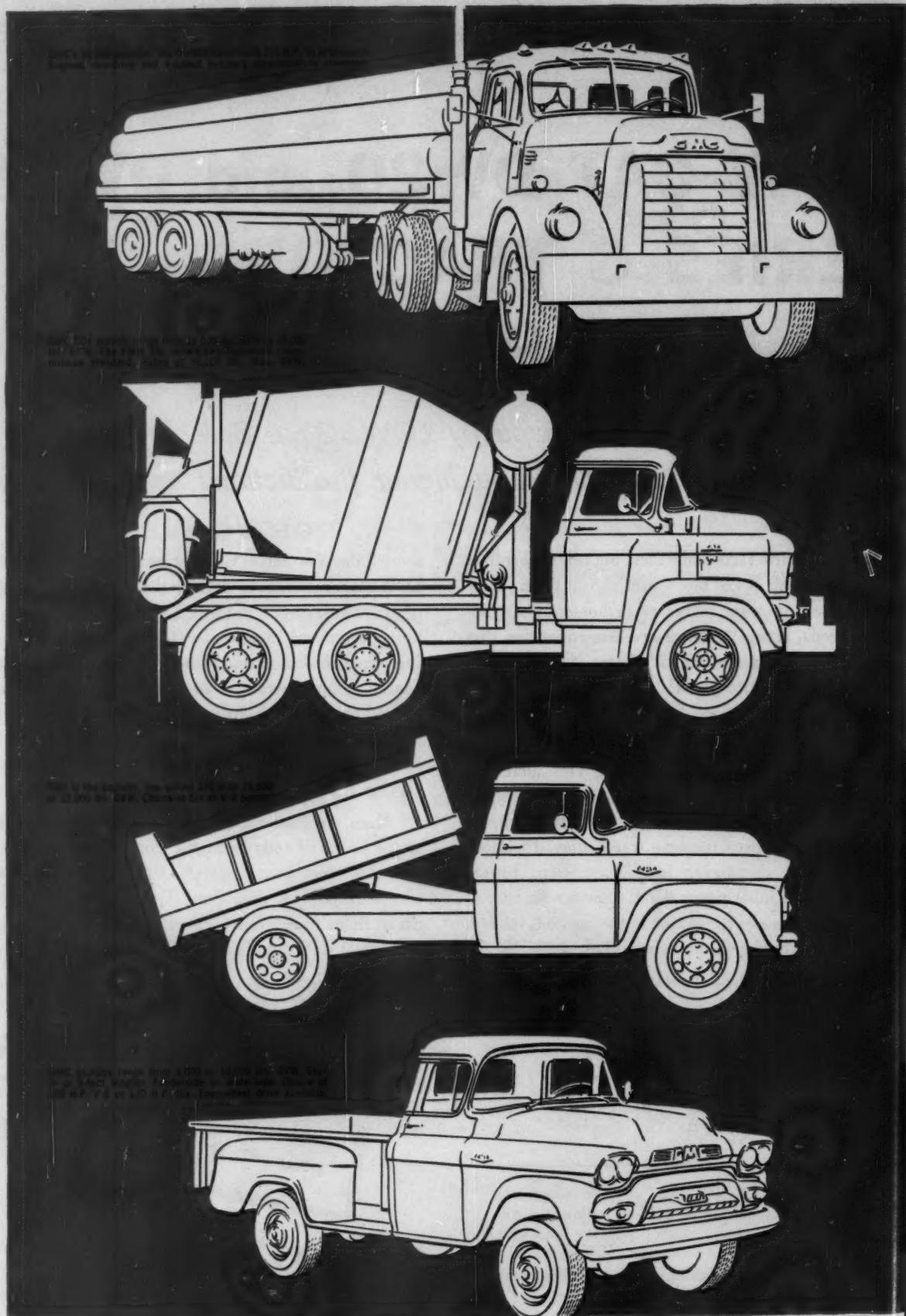
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**BORN OF RESEARCH
PROVED IN THE FIELD**

TIRES: 29.5-29 (28-ply rating) are now standard in place of the former 29.5-29 (22-ply rating)—a tire capacity increase of 16% to match the increased scraper capacity, heavier machine weight and higher speeds made possible by more HP. Note: On the DW20 Series G, the front tires remain the same—14.00-24 (16-ply rating).



***PROJECT PAYDIRT:** Caterpillar's multi-million-dollar research and development program—to meet the challenge of the greatest construction era in history with the highest production earthmoving machines ever developed.



GMC

OPERATION "HIGH GEAR"

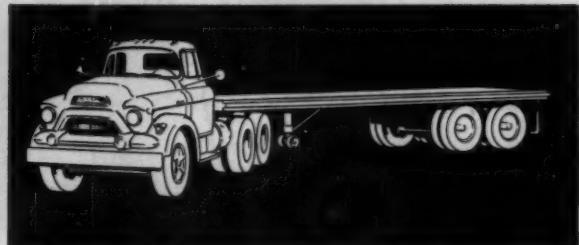
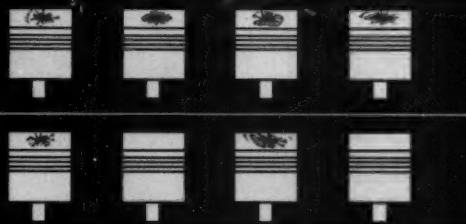
It's bringing you
more "Guts and Go" for less
dough than anything built
for the construction industry!

The most dynamic engineering, design and quality-control program the industry has ever known is bringing you the greatest money-saving, money-making advances in trucks today.

A new heavy-duty diesel engine with record-breaking economy and long, reliable life! New

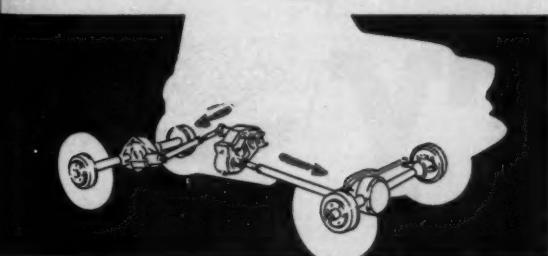
M-400 bearings with *seven times* the life of others! These are just a few of the things GMC Operation "High Gear" is bringing you. That's why there was never a better time than right now to see your GMC dealer.

GMC Truck & Coach—a General Motors Division.



Higher efficiency yet lighter weight! With GMC 2-cycle diesel (at top) *every* down stroke is a power stroke. 4-cycle diesel (at bottom) used by all other leading manufacturers only gives a power stroke *every other* down stroke. GMC engine delivers more horsepower per cubic inch and actually weighs less!

Biggest selection of Six-Wheelers in the industry! There's a model for every job. You choose from the widest combination of components ever offered—engines, axles, tandems, wheelbases, GVW's and GCW's—any combination that does the job at lowest cost!

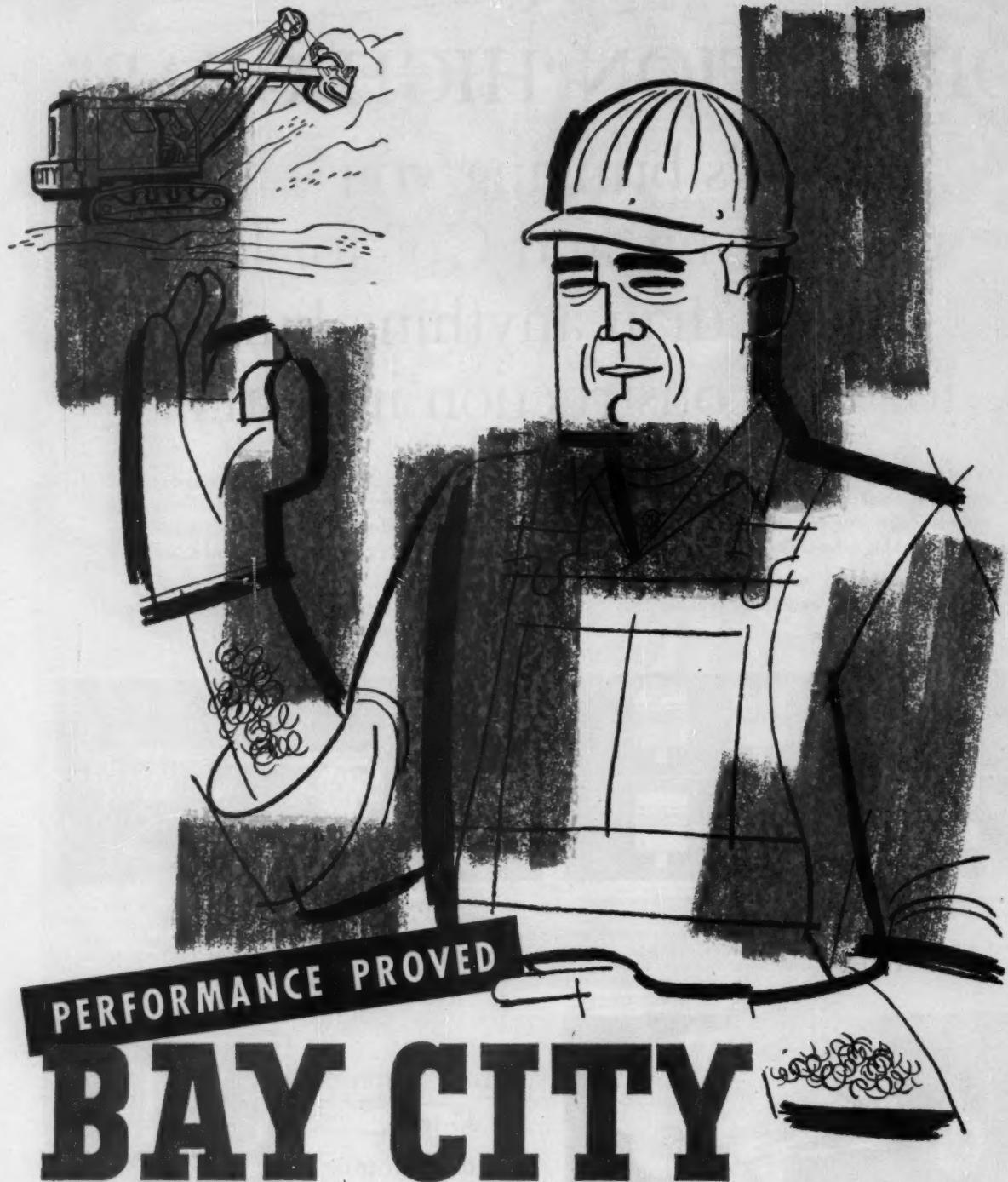


Positive traction on any terrain! A GMC with 4-wheel drive goes up even 60% grades with a full load. Driving on all four wheels doubles traction . . . jobs never get bogged down.

From $\frac{1}{2}$ -ton
to 45-ton . . .
General Motors
leads the way!

GMC
GENERAL MOTORS
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TRUCKS

man! that BAY CITY has
real rugged machinery!



THE WORLD'S BEST BUILT SHOVELS AND CRANES

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN, U.S.A.

Airfield Builders Push Four AFB Projects in Michigan

IT ISN'T OFTEN that you see four big contractors lined up within a few miles of one another on almost identical airfield construction projects. When it does happen, you have a unique opportunity to compare their techniques.

That's the situation right now on a series of Air Force base projects in Michigan. The four contractors are Western Contracting Corp. of Sioux City, Iowa, The Lane Construction Corp. of Meriden, Conn., S. J. Groves & Sons of Minneapolis, Minn., and a joint venture of Hoyle-Newberg and Gust K. Newberg Construction Companies, both of Chicago.

Each contractor is working on a different base. The jobs, which average \$9 million in size, are part of a \$100 million dispersal program for the Strategic Air Command in Michigan. SAC is enlarging the four bases to handle heavier planes.

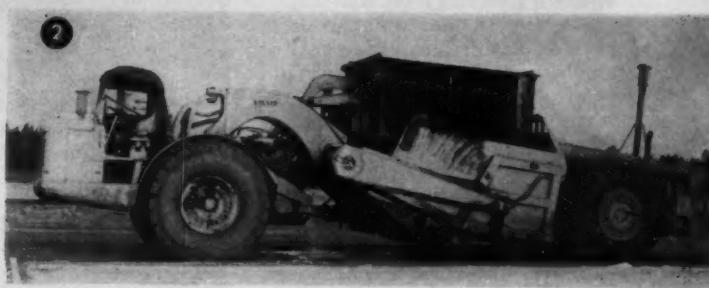
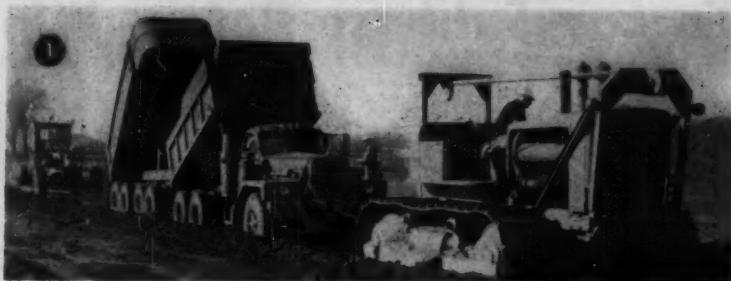
The biggest part of each contract is the extension of existing runways from 9,000 ft to 12,000 ft or the construction of a new 12,000-ft runway. Also included are roads, fuel facilities, and miscellaneous installations.

The Detroit district of the U. S. Army Corps of Engineers, under the command of Colonel Peter C. Hyzer, is acting as construction agent for the Air Force for the program. It is the largest single construction program that the district has ever undertaken.

The four major contracts were let last summer. This gave the contractors time to get their plants set up before the winter slowdown. Most of them also managed to complete a sizable part of the preliminary earthmoving before the cold weather stopped operations. They are all ready to hit full production at the first sign of good working weather this spring.

Most of the work will be finished next fall with a few items being carried over until the spring of 1960.

continued on next page



1. Selfridge Air Force Base—Trucks haul 40-ton loads.
2. Wurtsmith Air Force Base—Scraper wets coarse sand fill.
3. Kinross Air Force Base—Breaker shares runway with planes.
4. Sawyer Air Force Base—Big crushing plant supplies aggregate.



At Selfridge Air Force Base . . .

Western Moves Quickly To Lay Subbase Before Winter

At Selfridge, located 15 mi north of Detroit, Western has a \$9.5-million contract. They started last August and will be finished in June, 1960.

Selfridge is the only one of the four bases to be built on a clay soil (the others are on pure sand). This has strongly influenced Western's strategy on the job.

They figure that a flat, poorly drained clay area would be really tough to work in the spring if it is left exposed, especially if there is any amount of rain. So all their efforts last fall were aimed at preventing the area from becoming a mudhole next spring.

They set up a high capacity plant for base material and laid the first course of gravel as fast as they could haul it in. They tried to cover the whole area with at least one lift rather than concentrating on any one section and finishing it.

They were aided by an unusually dry fall that allowed them to cover all the dangerously exposed clay. This will enable them to work without too much interruption in the spring, even if, as the engineers pessimistically predict, it is a wet one.

Western did some paving in the fall. The contract required that one section, involving 60,000 cu yd of the 250,000 cu yd total, be paved by December. Western completed this but did little more. Next spring they will set up five pavers in two spreads and really start to roll on the paving phase.

Part of the paving done last fall was to overlay the existing 10-in.-thick runway with 9 in. of new concrete. This was a fairly straightforward job but there were a few special problems.

The joints in the new pavement had to match the joints in the old slab. Otherwise the overlay slab would be likely to crack over the locations of the old joints. To



EARTHMoving—Nearly 1,000 hp is concentrated on picking up a single load of clay from a wet spot as a Euclid TC-12 tractor pushloads a Euclid twin engine scraper.



PRODUCING GRAVEL—Contractor-built portable crushing and screening plant converts pit run gravel into proper subbase material. Maximum capacity of plant is 420 tph.



COMPACTION—Michigan 375A loader tows rubber-tired Ferguson roller to compact subbase. Unlike other three jobs, well-graded gravel base at Selfridge compacts easily.

match the longitudinal joints Western had to limit their paving lanes to 22 ft, the width of the existing lanes. They lay 25-ft lanes on new work.

Western dry batches their concrete in an automatic plant set up on the site. The capacity of the plant is adequate to keep five pavers supplied. Paving production last fall averaged 2,700 cu yd of concrete per day.

The base material pit is 25 mi from the site. Western hauls the material to the base in semi-trailer trucks with tandem trailers attached. They use 25 trucks, ranging in capacity from 30 to 40 tons. Michigan is one of the few states that allow such rigs to travel on the highway, and Western took full advantage of this to haul in the maximum quantity of base material.

Western's screening plant is a portable rig that they assembled on a 16-wheel trailer. They first used it on another airfield paving job in North Dakota (CM&E, Sept. 1957, p. 93).

The screening plant can move by road from job to job. During a move the outriggers, feed bins, and crusher are removed. Portability is an advantage on the job, too. Western plans to move the plant at least once to a better spot in the present pit.

The capacity of the plant is 420 tph, but on this job Western only gets an effective 330 tph because they are rejecting much of the fine material.

The unit is 114 ft long, 24 ft wide, and 45 ft high. Portable 48-in. Kolman conveyors feed the plant from the stockpile and deliver the finished product at the other end. Two bulldozers—a D8 and a D9—excavate pit material and feed it to the conveyor. No shovels or cranes are needed.

Oversize material goes through a Symons 4-ft cone crusher driven by a Cummins 155-hp diesel engine. The rest of the material goes through a Simplicity 6x14 triple deck vibrating screen.

A Cat D-17000 electric set supplies most of the power for the plant, but Western also buys some outside power.

Malcolm Schaller is project manager for Western. Cy Schulte is superintendent of the gravel plant. Hart Campbell is resident engineer for the Corps of Engineers.

At Wurtsmith Air Force Base . . .

Lane Struggles to Get 100% Compaction of Sand

At Wurtsmith, near Oscoda, Mich., Lane has a \$10.4-million contract, the largest ever awarded by the Detroit district of the Corps of Engineers.

Lane's biggest problems so far have been caused by soil conditions, but the situation is different from that at Selfridge. Where Western is afraid of getting too much surface water, Lane has trouble getting enough.

The whole area is relatively coarse sand with little gradation and practically no fines. It is difficult material to compact. And it provides very little traction for vehicles.

To get compaction Lane poured a tremendous amount of water onto the sand. They sunk four 8-in. wells and laid a complete irrigation system consisting of 5,000 ft of 4-in. quick-coupling aluminum pipe. They also hauled and distributed water in Euclid scrapers and bottom dumps that had been fitted with tanks ranging in capacity from 4,000 gal to 6,000 gal.

They used three types of rig to compact the wet sand. They reached 95% compaction with 50-ton Ferguson rubber-wheeled rollers followed by 50-ton Cedar

Rapids vibratory compactors. A Lima Roadpacker gets the final lift to 100% compaction.

On the surface they were short of water. But 14 ft down, where they were laying storm sewer pipe, there was too much water. At that level it took a wellpoint system to remove 3 ft of ground water from the trenches before they could lay the pipe.

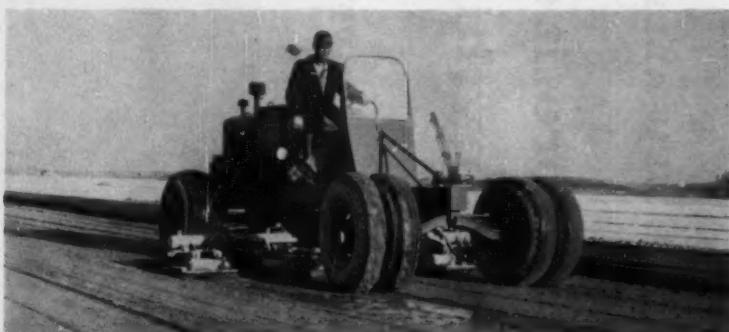
The traction situation called for drastic measures. The trucks were floundering around in the sand, slowing the flow of aggregate to the paving train.

So Lane brought in a large supply of second-hand airplane tires and put them on all types of equipment, including the trucks. This type of tire is common on some equipment, graders, for instance. It is not common on trucks.

They had some trouble making special rims for the tires on the trucks. But the scheme paid off. The airplane-wheeled trucks rolled across the sand easily.

Wurtsmith is the only one of the four bases where the entire runway has to be built new. There was considerable clearing and grubbing to do to prepare the land for the runway. Lane

continued on page 89



COMPACTON—Lima Roadpacker is one of several machines needed to achieve 100% compaction of base. Large quantities of water were added to loose sand during process.

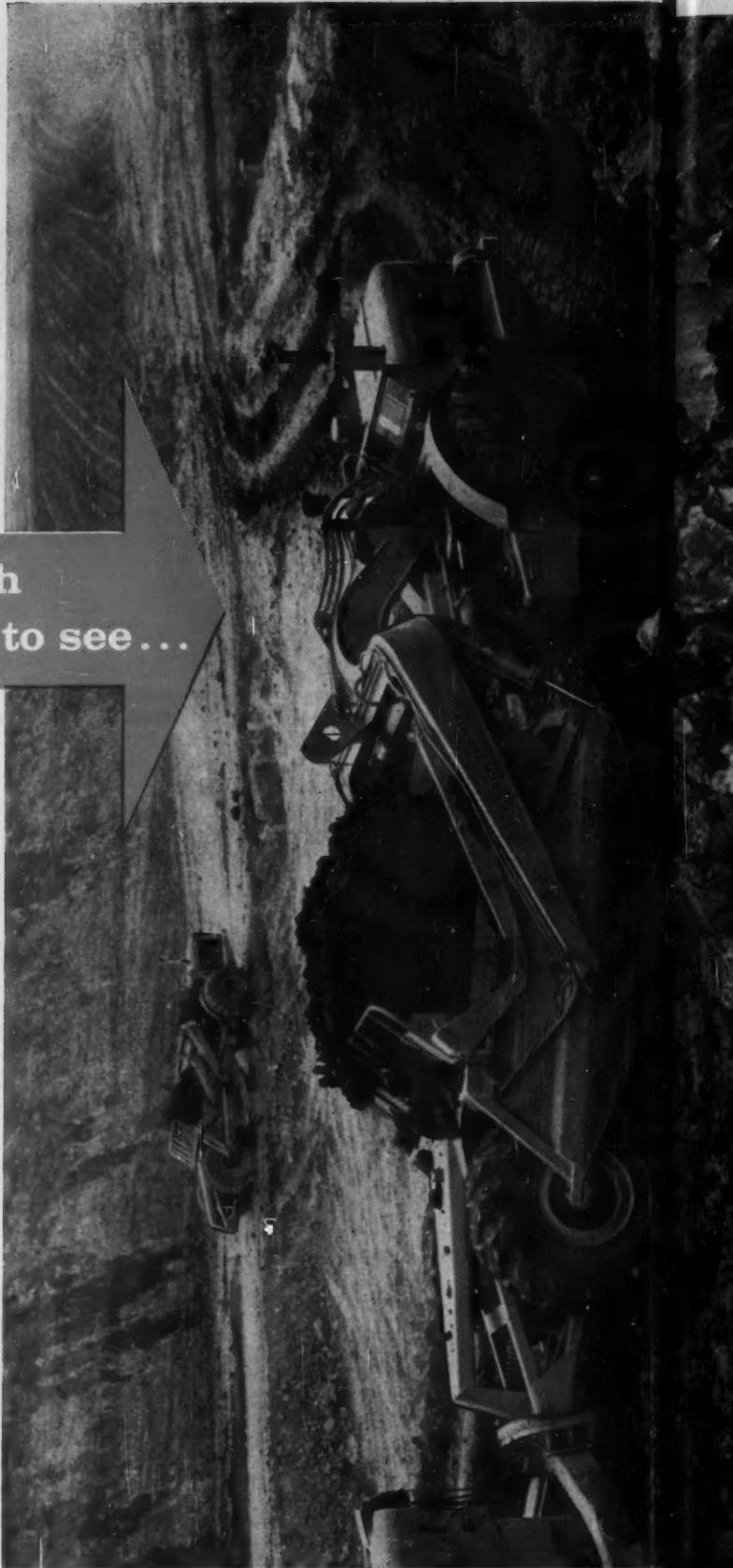
THE NEW ALLIS-CHALMERS TS-260

**More profit capacity for you
than anything near its size!**

230 HORSEPOWER • 17 YARDS HEAPED

For two years, the TS-260 has been the hottest motor scraper in the business . . . and now it's even better. If you're looking for new ways to boost net profit on your earthwork, we invite you to check these facts . . . then compare the new TS-260, dollar for dollar, with *any other make*. And since words don't really prove a thing, we hope you'll compare *on the job*.

**Here's news worth
swinging around to see...**



230 horsepower—more power per struck yard than any other unit near its size.

30,000 pounds of rim pull in low gear—an even bigger edge over other makes than before.

17 yards heaped capacity with low, wide bowl design and forced ejection, of course. You're sure of big loads...quick, clean dumping every time.

New KON-TORK torque proportioning differential—automatically concentrates power on wheel with best traction... mud, sand or gumbo.

180-degree turns in less than 30 feet to help you save cycle time in tight spots on narrow cuts or fills.

Five speeds to 28 mph...with constant mesh transmission and new air-actuated transmission brake for faster, easier shifting. The new TS-260 is easy to handle from cut to fill.



Opportunity for added profit...Interchangeable with the TS-260 scraper, the TR-260 rock wagon gives you a source of extra income on overhead loading jobs at a fraction of the cost of another special unit. *Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.*

TS-260
ROCK WAGON
15 yards heaped
20-ton payload

TR-260
MOTOR SCRAPER
230 horsepower
17 yards heaped



move ahead with ALLIS-CHALMERS...power for a growing world

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This helpful system, devised especially for contractors, is a key part of Mobil's Correct Lubrication Program, an overall plan that also includes these important Mobil aids:

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Get in touch with your Mobil representative. He'll be glad to show you how valuable this system can be.



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Available—film on equipment safety, maintenance.
Call nearest Socony Mobil office.

Correct Lubrication

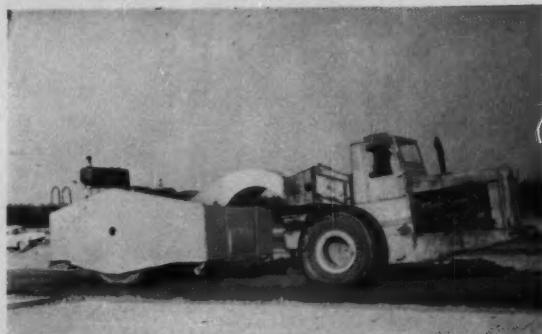
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2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
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4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Special Machines Handle Difficult Jobs



ROLLER—Earthmoving subcontractor connects Cedar Rapids compactor to Tournapull tractor to make cheap self-propelled roller.



SPECIAL TIRES—Lane fitted airplane tires onto most of the aggregate trucks to give them enough traction to travel over sand.



FORM PULLER—Air-powered cylinder moves lever on A-frame to lift pins from forms. Engine of farm tractor powers compressor.



LIFT TRUCK—Versatile Cary-Lift sorts rock for rip-rap. Rig was especially effective for stoking brush piles for burning.

subcontracted this work to Sugden and Sivier, Inc. of Oak Park, Mich.

Sugden cleared 400 acres in 60 days. They used Euclid TC-12 and Cat bulldozers to knock down the trees and make the original burning piles. They repiled and restoked the piles with a Pettibone-Mulliken Cary-Lift.

They figure this rig cut piling and burning costs by 50% over doing the entire job with bulldozers. The machine has a high fork lift and a 4-ft forward carry that enables it to lift brush and shake out the dirt before replacing the brush on the pile.

Sugden, who also has a subcontract for the subgrade, used the Cary-Lift for a number of other jobs including separating broken concrete for riprap and laying 54-in.-dia sewer pipe.

Sugden crews put together several home-made rigs. They made two self-propelled roller units from standard components. One consists of a Ferguson 50-ton roller connected to a Tournapull C tractor. The other has a Cedar Rapids vibratory roller also connected to a Tournapull tractor.

They simplified the connections between the components by cutting each rig at the gooseneck and

welding on plates that are bolted together to connect the rigs. They figure their units are cheaper than ready-made self-propelled rigs; in addition, the components are interchangeable.

They favor winch-lift trucks for hauling base material. The ones on this job were of 15-yd capacity, made at a cost of \$18,000 apiece. They use Mack tractors on front. The trailers seem indestructible. Sugden has run one 250,000 mi. It outlasted several tractors and has had no serious maintenance problems.

Lane got into the do-it-yourself act, too, with a rig to remove

AT WURTSMITH AFB . . . continued

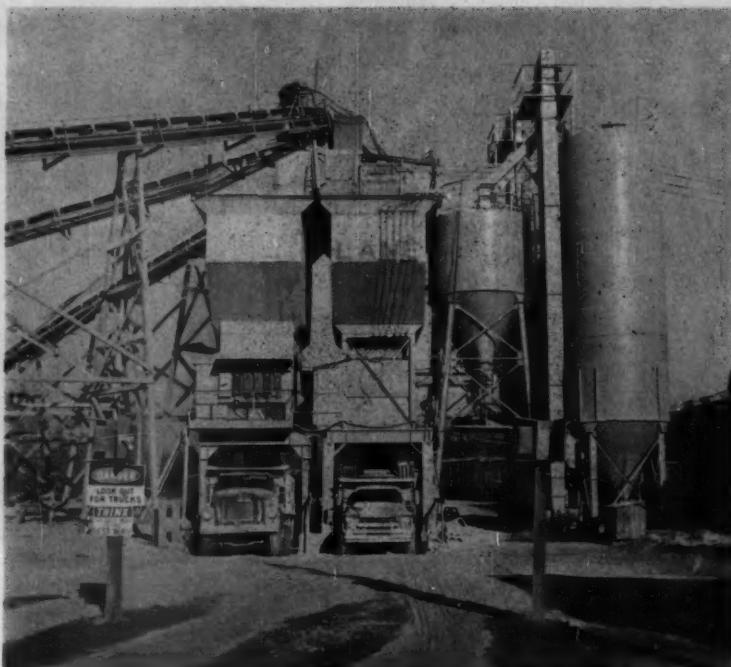
paving forms. On a Ford-Ferguson farm tractor they mounted an air compressor that runs off the tractor engine. The compressor powers a hydraulic cylinder mounted on an A-frame over the tractor. The shaft of the cylinder lifts the form pins.

Lane concentrated heavily on paving during the fall. They set up a paving train with three and sometimes four Koehring 34E pavers. With this setup they poured up to 6,000 cu yd in a 15-hr day.

Lane's batch layout is the biggest on the four jobs. It is a Noble pushbutton plant that can feed two trucks simultaneously. It has a storage capacity of 3,000 bbl of cement and 300 tons of aggregate. Lane has five rail sidings to handle the 140 cars of aggregate that arrived each day. An additional two sidings handled the cement cars.

W. L. Stanton is project manager for Lane. Daniel Keliher is resident engineer for the Corps of Engineers.

continued on page 92



BATCH PLANT—Large capacity batch plant has dual storage bins. It can load two trucks simultaneously. Each day 140 carloads of aggregate arrive by rail to feed plant.

THIS JOB 6 MONTHS AHEAD OF SCHEDULE



JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems Dewatering Planning—Equipment—Service

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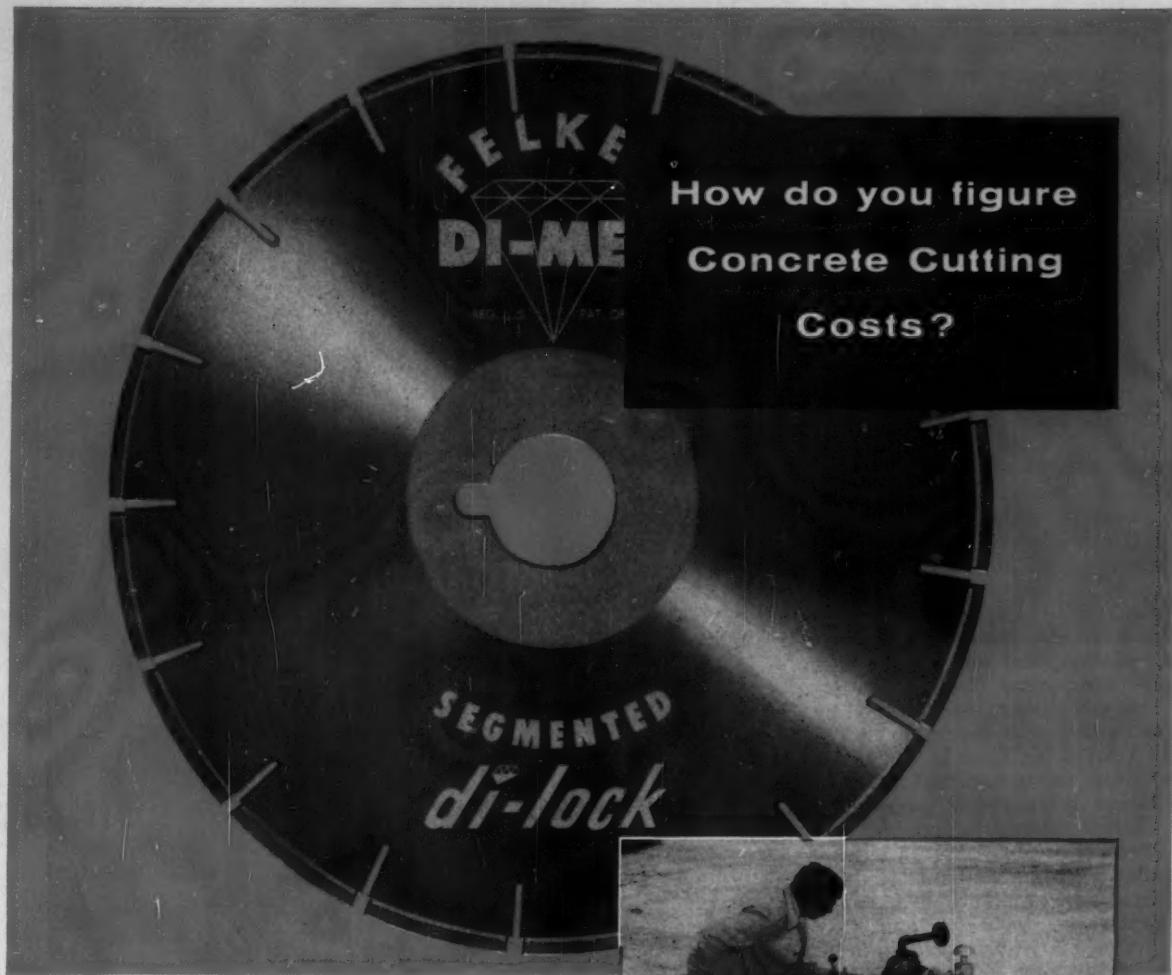
Stang dewatering cuts time by 50% and reduces costs!

Maximum coordination between wellpoint dewatering, excavation, concrete and rip-rap moved this beach front flood control project ahead by six months. As a result, more than substantial unit cost savings were realized.

Saving time and money by efficient dewatering is a Stang-proved fact. Consult them on your next project for the finest in engineering, equipment and service.

Project: Santa Ana River Improvement; Orange County, Calif. Flood Control District
General Contractor: MacDonald & Kruse
Dewatering Contractor: Subgrade Engineering





How do you figure
Concrete Cutting
Costs?

One contractor estimated his on a
cost/foot basis and was surprised
at the outcome with

di-lock Diamond Blades

On a large airbase job the contractor had 450,000 lineal feet of control joints to be sawed to a depth of $3\frac{1}{2}$ to $3\frac{3}{4}$ inches. When bidding this job he estimated blade costs at 25 cents per foot—a figure which he felt dangerously low for the conditions encountered. Here's how the job shaped up in actual production.

Using a multiple blade saw equipped with two Felker Di-Lock FDC-60 blades, 5535 lineal feet were cut before blades were exhausted. Reducing this total footage to cost per foot, the astonishing figure of 9.2 cents per foot was obtained...little more than $\frac{1}{2}$ of the original estimated cost!



Felker manufactures a complete line of concrete saws from 36 h.p. (illustrated above) to 9.2 h.p. models. Ask for literature and prices.

**FELKER DI-LOCKS SETTING RECORDS
FROM COAST TO COAST**

Whatever the application...on concrete, on masonry materials of all kinds, in hard, tough going you'll find longer life, more cutting speed, lower ultimate blade costs when you specify Felker Di-Lock Diamond Blades! Ask your Felker distributor to recommend the best bond type for your material. You'll be happy with Di-Lock's results!



FELKER MANUFACTURING CO.

Torrance, California

World's largest manufacturer of Diamond Abrasive Cut-Off Blades and Machines

At Kinross Air Force Base . . .

Groves Meets Air Traffic Problems

Compared to the hard-driving Lane outfit, S. J. Groves seemed to set an almost leisurely pace at the Sault Ste. Marie base during the fall. One reason was that they have less work to do (contract \$7.3 million) in the same length of time. Another is that the site presents few problems.

The soil, for instance, is sandy and so well drained that they could continue earthmoving operations even during a light rain. The sand also has a good natural gradation and compacts easily. For compaction Groves used Essick vibratory rollers followed by a Jackson plate vibrator.

Groves did have to add water during compaction. But they obtained it easily by pumping it through a 6-in. aluminum pipe from a nearby lake. Next year they will lay almost 9,000 ft of irrigation pipe to distribute the water over the entire area.

One of Groves' biggest problems was air traffic. In addition to being an Air Force Base, Kinross serves as a terminal for three civilian airlines, including a foreign company, Trans-Canada Airlines.

At one point in the summer Groves had to close the main runway, and all planes used a smaller secondary runway. This was all right with the Air Force and the two U. S. airlines whose DC-3's could land on the smaller runway.

But Trans-Canada was seriously affected because they were using four-engine Viscounts on this route, and the Viscounts were too big for the secondary runway. It could have developed into an awkward situation except that Trans-Canada agreed to switch to DC-3's temporarily while the main runway was out of commission.

The heavy air traffic hindered Groves in other ways, too. They had to break up the old taxiways in strips, leaving a passage for the planes until the new taxiways were complete. And they had to

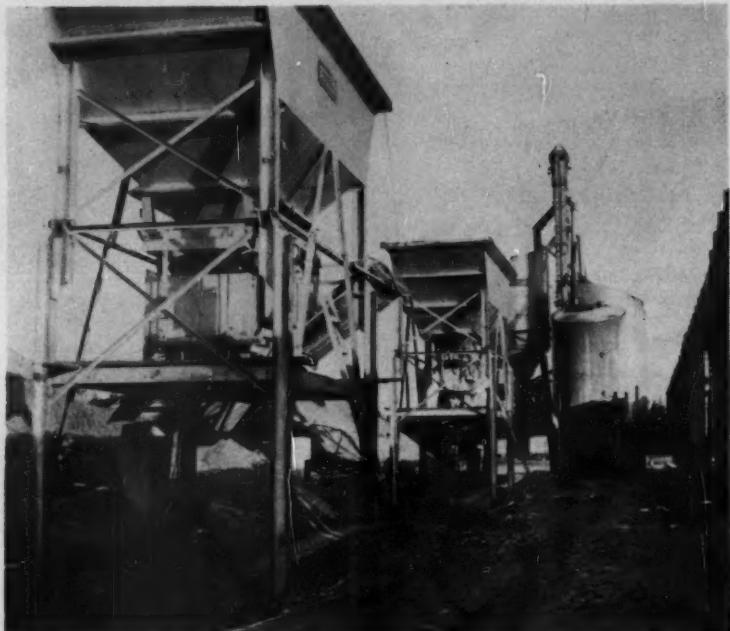
keep runways clean for the Air Force jets. This involved both mechanical and hand sweeping.

Groves started their contract later in the fall than the others, and they haven't progressed as far. But next summer they will move fast. They hope to place

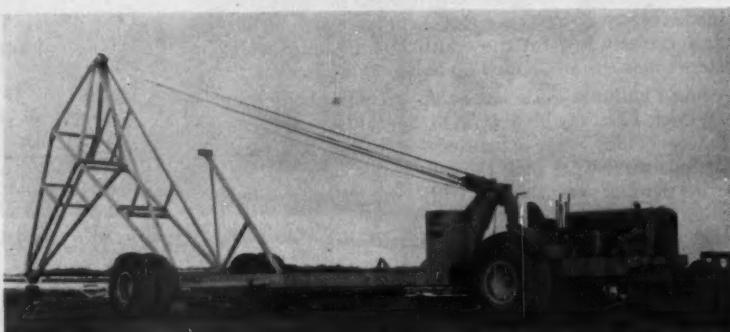
300,000 cu yd of concrete in five months and finish the whole job by October.

Frank A. Vogelsburg is project manager for Groves. Frank Crevier is resident engineer for the Corps of Engineers.

continued on page 96



BATCH PLANT—Butler bins and batcher are set in line to form three-stop batch plant. Clamshell feeds bins from aggregate stockpiles (left). Cement comes in by rail.



UNUSUAL CRANE—Tournacrane, developed by R. G. LeTourneau for lifting disabled aircraft, proves to be fast and effective for handling Groves paving machinery.



B Tournapull is available with 325 hp GM power-plant, or, as torque-converter "B", with 335 hp Cummins engine.

This scraper loads more pay-yards...faster... because it makes better use of its "horses"

Compare BIG scrapers available today, and you'll note that most of them offer engines in the 300 horsepower range. This "flywheel hp," however, is only *part* of the scraper power-picture. *More* important...as far as load size and loading speed is concerned...is how much of that power is *wasted*, and how much is actually *used*.

Consider, for instance, the 325 to 335 hp LeTourneau-Westinghouse B Tournapull® with 28-yd Fullpak® scraper. This machine gets *bigger loads faster* because it makes *fullest possible use* of power — its own, and that of its pusher. Here's how...

Low, wide bowl cuts power loss
Its Fullpak scraper design, for instance, is an important power-saver. Low and wide, it lets dirt flow back into the bowl almost on a straight

line. With blade in ground, Fullpak floor has a rise of only 1°, front to back. That means that more prime-mover power can be concentrated on *pulling* and *cutting*, less on *lifting*.

Because Tournapull's push-block is low, maximum pusher-thrust is directed squarely behind the blade where it's needed. Pusher-plate, push-block, and scraper-blade "line up" for concentration of maximum power. Direct line of push also eliminates "humping"...steadies the scraper for easier loading and more accurate grading.

Construction details of the "B" also cut power-waste, because they reduce friction-loss. Heavy-duty roller bearings, for instance, are used throughout. Welded steel construction eliminates force wasted in twisting and distortion. Tournapull's

simple design eliminates a lot of heavy hardware, whose dead-weight robs you of power. And drive-train is short-coupled, efficient...doesn't waste power in detours between engine and work application.

"Electrics" use hp only when needed

Electric controls are horsepower savers, too. Instead of continually dragging on your engine, as hydraulics do, current for Tournapull scraper controls is generated only when needed. And the *instant* response of "electrics" eliminates wasteful "build up" of power for operating scraper controls.

Look at the *whole* power-picture when you compare scrapers. For complete information on the B 'Pull*, see your nearby LeTourneau-Westinghouse Distributor.

*Trademark BP-1748-DC-1



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Timken-Detroit "3 for 1" Axles Are First Choice With Big Fleet Operators!

These superior features make the difference:

Interchangeability of Three Final Drives. Single-Speed Single-Reduction, Single-Speed Double-Reduction or Two-Speed Double-Reduction final drives using the same housing, hubs, drums, brakes and axle shafts gives your vehicles unmatched flexibility. Parts are readily available and less expensive.

Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . plus lower maintenance costs.

True Double Reduction. Two full size gear sets, one for each reduction, provide huskier gears and a balanced distribution of effort. Gears and bearings last longer and need less maintenance.

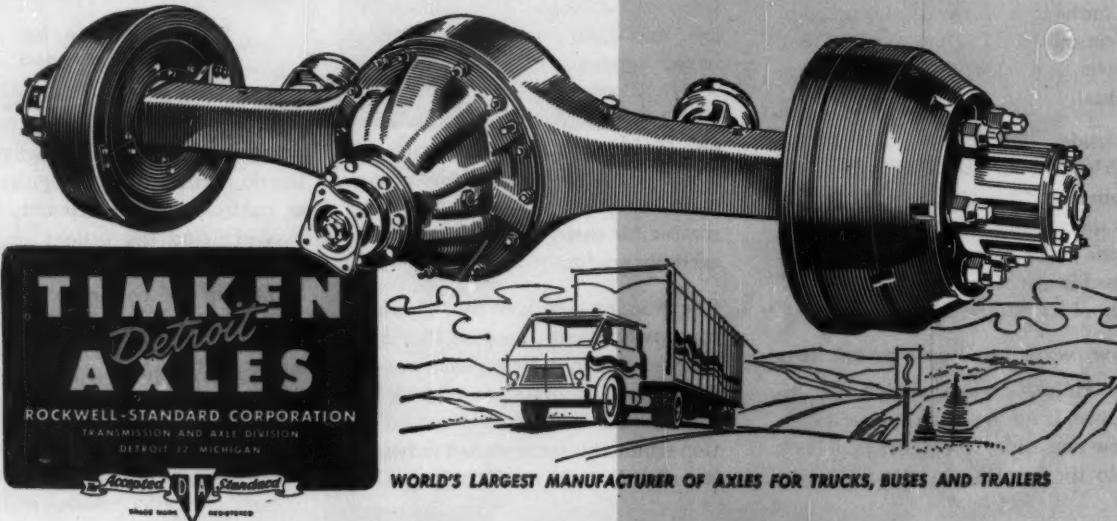
Torsion Flow Axle Shafts. More splines, plus greater root and body diameter, add extra strength.

Famous Time-proved Differential. Extra-strong gear body and teeth, plus hot-forged trunnion, give long trouble-free operation even under the roughest kind of treatment.

Hot-Forged Steel Axle Housing. The rectangular form of these high carbon steel housings is the lightest, strongest shape of housing that is available today.

PROVED
AND
PREFERRED...

Timken-Detroit® Axles are the Accepted Standard!



Products of **ROCKWELL-STANDARD** Corporation

HOW YOU CAN:

- **speed-up fill compaction**
- **reduce equipment congestion**
- **handle scattered dozing at lowest cost**

With the big yardages hauled by today's larger capacity earthmovers, you stand to lose profits if you must delay hauling cycles to allow time for specified compaction. These delays may be caused by: 1) inefficient compaction tools; or, 2) too many slow-moving dozers, graders, and compaction units working in such a small area that they get in the way of your production units.

To solve this problem — and automatically reduce your equipment investment — you can replace slow-speed dozers and tow-tractors with fast, heavy-duty, rubber-tired LeTourneau-Westinghouse Tournatractor®. Here's how this multi-purpose 210-hp tractor can help you speed-up dozing and compaction... and *save you money*.

1. Works fast... compacts more fill per day — Powerful L-W rubber-tired tractor tows compactors weighing up to 50 tons. This — together with its high speed, maneuverability, easy handling, and ability to level fill with dozer blade while towing a compactor — makes it possible for Tournatractor to meet specified compaction requirements faster and in fewer passes.



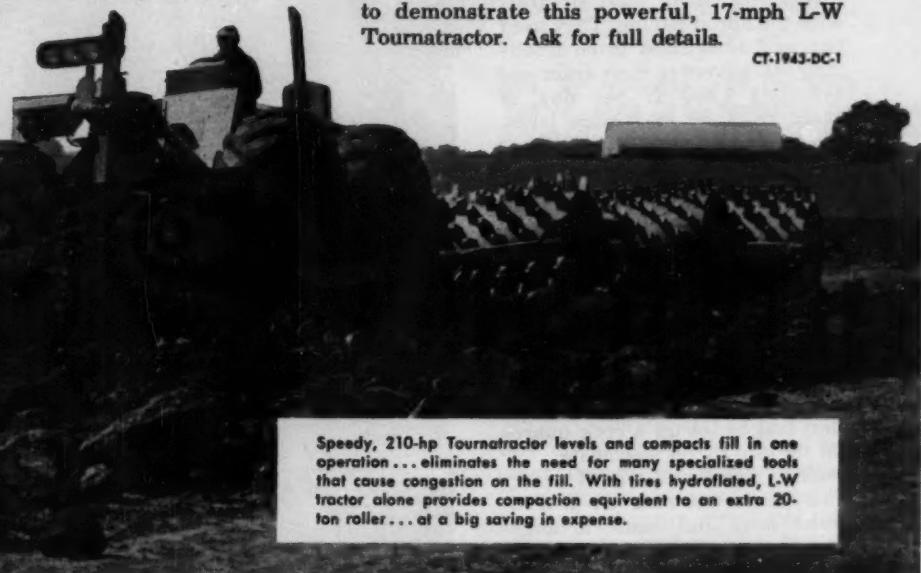
2. Gives bonus compaction equal to extra 20-ton roller — With tires hydroflated, Tournatractor itself provides *bonus compaction equivalent to an extra 20-ton roller*. Rolling action of its broad, low-pressure tires confines and compacts soil under the tread — rather than displacing it. As a result, it helps obtain maximum compaction in less time.

MOBILE "JOB BALANCER"

When compaction work is completed, mobile L-W tractor is ideal for hit-and-run assignments. At a moment's notice, operator can unhitch towed tools and drive to cut area to balance pushers... or it can smooth haul roads, build shoulders, handle stockpiling, restore washouts, cut drainage ditches. Tournatractor will handle dozing or towing jobs anywhere on your project, to help complete your work faster... at bigger profit.

Let us give you the whole story. We'll be glad to demonstrate this powerful, 17-mpg L-W Tournatractor. Ask for full details.

CT-1943-DC-1



Speedy, 210-hp Tournatractor levels and compacts fill in one operation... eliminates the need for many specialized tools that cause congestion on the fill. With tires hydroflated, L-W tractor alone provides compaction equivalent to an extra 20-ton roller... at a big saving in expense.

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS



A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit.

At Sawyer Air Force Base . . .

Newberg Operates Big Crushing Plant

The Newberg joint venture has a \$10.1-million contract to enlarge this base, located about 10 mi south of Marquette, Mich.

There was a traffic problem here, too. Air Force jets used the main runway all summer, preventing Newberg from working on it. But now the whole squadron obligingly has moved to Kinross and will stay there until the construction is finished. So Newberg will have a clear working area next summer.

Limited by the traffic situation, Newberg concentrated all their efforts last fall on one area—the 3,000x775-ft operational apron. They got the apron 50% complete before winter set in. They figure to do much of the rough earthmoving this winter, then hit the runway paving next summer.

The job is in hilly country, unlike the other bases, and it involves more earthmoving. Newberg had to move 500,000 cu yd before they could start the apron. The total quantity is 3,000,000 yd.

Newberg made good progress with the apron paving. They used two and sometimes three Koehring 34E pavers in their train and averaged 2,500 ft per day of 16-in. thick by 25-ft wide lanes. They planned to pave 7 lanes last fall, actually completed 19.

They had good luck with their earthmoving, too. The sand is easy to move, and it compacts well. Newberg used three Terrepac Vibra-plus rollers followed by a Jackson vibratory compactor.

The other jobs either brought their aggregate in by rail or were able to screen it in a local gravel pit. Newberg is the only outfit that had to set up a rock quarry on the site to get aggregate.

They discovered a good quarry site beside the base on government land and made arrangements to put a road in to it and remove the rock. The granite from this quarry is very hard. It makes good concrete but sawing joints in it is tough.

continued on page 98



COMPACTION—Caterpillar D6 tractor pulls three Terrepac Vibra-Plus vibratory compactors over sand fill. Sand at Sawyer is well-graded, easy to handle and compact.



CEMENT PLANT—Duplicate unloading facilities on each side of cement batcher are designed for fast unloading of trucks that haul cement from rail siding 1 1/2 mi away.



NEW TRUCK—Experimental truck is being field tested by Corps of Engineers for first time. Large wheels give it 22-in. clearance, axle to ground. All parts are standard.

Cut your working-time on finish- grading



Adams* control-power applied thru dirt-free gears and short shafts... gives you more accurate cutting... reduces machine maintenance and downtime.

The extra "passes" it takes your graders to cut an exact finish grade cost you money. Every cut made accurately — the first time — boosts grader output, cuts per-job cost. For dollars-and-cents reasons, it's important to select the grader that gives your operator the most precise blade control... an Adams.

All heavy-duty Adams motor graders — 190, 160, 135, 123, 115, 80 hp — provide positive, engine-driven control of blade. Your operator can count on the same smooth, constant blade movement, no matter how many control levers he operates.

Power for control of blade and leaning wheels is transmitted by gears that are enclosed and protected from abrasive dirt. Gears that give long life without developing "play" ... that require less greasing, inspection, and replacement. Gears that afford precise blade-control for more "one-pass" cuts on the finish grade.

Here's why:

1 **Enclosed, gear-driven lateral shift.** Protected gear-mechanism collects no abrasive dirt that can wear gear faces and produce "play". Any such looseness would be greatly magnified at tip of the blade, causing excessive "washboard", poor finish grade.

2 **Enclosed, gear-driven blade lifts, with short-coupled lift arms.** Shortshafts, between gearing and lift arms, minimize twist on shafts... permit almost no deflection of the blade.

3 **Circle, with dust-protection flange and replaceable gear-segments.** It's easy and inexpensive to renew your circle

gear, by replacing only the teeth that are worn... no downtime for disassembly and installation of complete new circle.

4 **Enclosed, gear-driven leaning-wheel mechanism.** Positive protection against flying dirt and fouling by too-high windrows. Wheels hold set position... require no lock-pin for absolute safety at high travel-speeds or when using front-end attachments.

See for yourself how these, and other, cost-cutting Adams features help you grade more accurately, cut deeper, push more dirt faster than other similar graders. Call or write us for complete descriptive information and a demonstration.

*Trademark G-1568-DC-1



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

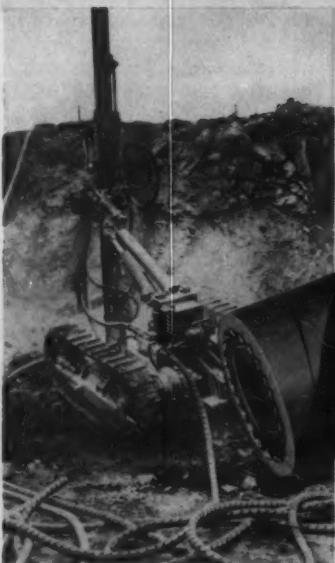
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**Yellow Cover
Black Spiral Stripe**

"HARDROK" Wire Braid AIR HOSE is being more and more widely used as its reputation for unequalled performance grows. You'll find it coupled to drills, jumbos and other heavy-duty air equipment on the toughest, roughest jobs. There's no mistaking its yellow cover with black spiral stripe . . . sure sign of longer service life and lower hose costs.

"Hardrok" specifications include oilproof Synplastic® tube; horizontally braided steel wire carcass; tough, wear-resistant rubber cover; $\frac{1}{2}$ " to 3" sizes; maximum lengths of 50 feet.

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AT SAWYER AFB...

continued

To quarry the rock, a Gardner Denver Air Trac and a Chicago Pneumatic rig drill $2\frac{1}{2}$ -in. holes an average of 45 ft deep for blasting. A P&H 755B shovel loads the blasted rock into trucks for a short haul to the crushing plant.

Crushing Plant

The crushing plant has two inputs. About 75% of the raw material is crushed rock that goes through a Pioneer primary crusher for reduction to 8 in. dia. The remainder of the input is pit run gravel that bypasses the crusher.

At the next stage screens remove the minus 2 in. material. The oversize is rerouted back through a Telesmith Gyrasphere crusher that reduces it to 2 in. size. From here it goes to the washer and stockpiles. The capacity of the plant is about 5,000 tons per 16 hr day.

Water comes from a river 1,000 ft away through a 6-in. pipeline. The used water goes back through a settling basin to the river.

The batch plant is a short truck haul away. Newberg is the only one of the four contractors who does not bring cement in all the way by rail. They bring it only to a siding at the edge of the base where it is transferred to trucks for the $1\frac{1}{2}$ -mi haul to the plant.

To build a spur right to the plant they would have had to cross a main highway and some rugged country. Newberg figured it would be cheaper to double-handle the cement.

Most of the equipment on this job is standard except for an unusual truck that the Corps of Engineers is trying out. The contractors are not using it as yet but are watching its performance on this job.

The main feature of the vehicle is the large wheels that give it a 22-in. clearance from axle to ground. It can move through mud and soft ground that would stop an ordinary truck, and can also travel up to 42 mph on the highway. Specially designed by Marmon-Herington Co. of Indianapolis, it uses only standard Ford parts that are easily obtained. The truck costs about \$10,000.

Arnold Anderson is project manager of Newberg. Richard Sneed is resident engineer for the Corps of Engineers.

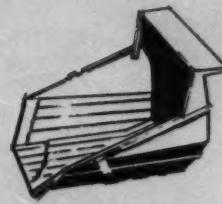
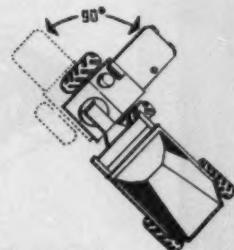
Haul problems?



L-W Rear-Dump may be your answer!

No two hauling jobs are exactly alike. Each has its own particular problems. There are long hauls and short... all types of earth-born materials. Some jobs have restricted loading and dumping areas. Others tough grades, rough temporary haul roads. And there are wide variations in maintenance and repair problems—depending on loads, abrasive material, shock, weather, and available facilities and servicemen. So finding the *right kind* of hauler to solve your present and future problems isn't easy. That's why we think you might like to check these "problem-solving" features found only on LeTourneau-Westinghouse Rear-Dumps. All these special advantages of this off-road hauler are available on all three sizes: 11, 22, 35 tons load capacity... 138, 210, 300 or 335 hp. And, to ensure steady earnings for you, other hauled units can be used behind same Tournapull® 2-wheel prime-mover. These include scrapers, bottom-dumps, flatbeds.

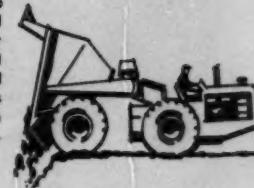
Faster spotting—Positive, electric power steer, through geared kingpin... pivots prime-mover to right angle for sharp 90° turns. As a result, unit makes continuous U-turn in less space than Rear-Dump's own length. In dump position, it turns in only about $\frac{2}{3}$ of over-all length! Result? You spot faster at the shovel... grizzly or hopper... and get away faster from congested pit or dump areas.



Easier loading—Wide bowl offers large "target" for easy-loading without spillage. Open rear of body provides wide, low entry for dipper—an extra speed advantage for your shovel.



Resist body shocks, damage—Rear-Dump stands up under heaviest loading jolts. Bowl is all steel—no wood fillers. Floor is lined with heat-treated tool-steel strips, welded to solid billets laid over heavy steel plate. Sloping sides deflect load shock, quickly cushion small floor area with layer of material against rock-damage.



Quick, positive dumping—Flick of fingertip switch on control panel instantly activates point-of-action electric hoist-motor. Body raises quickly to desired angle. At full dump position, edge of bowl is low behind rear wheels... material cannot roll forward to lodge against wheels, nor pile under rear end. Streamlined body sheds stickiest material readily. Front-wheel drive keeps power and traction on solid footing—well ahead of rear wheels—when dumping over high banks.



Hauls anywhere—Machine's big, low-pressure tires—5 to 6' tall, 1½ to 2' wide—"float" machine over sand, mud, rocks, RR tracks, or other obstacles. Broad tire-lugs maintain traction in any type of material. Power-transfer differential puts up to 80% of power on drive wheel with firmest footing, when either powered wheel begins to spin. Electric pivot-turn, through geared kingpin, lets operator "walk" prime-mover out of soft spots. Dumping action can also be used to "hump" hauler off a soft bank.



Simplified construction—Look underneath a Tournapull Rear-Dump... note that this machine needs no springs, no tie rods, no hose and pipe lines, no frame, no long drive-shaft that require maintenance and repair. In place of a foundation frame and body sub-frame, Tournapull prime-mover and trail-unit are hitched together by means of a high horizontal yoke. Yoke pivots horizontally on kingpin at front... then extends back along side of bowl, where it pivots vertically just above and ahead of rear wheels. This vertical and horizontal kingpin arrangement provides an easy oscillating action that eliminates most twisting, tilting strains... permits higher speeds on uneven ground.

R-1852-G-1

LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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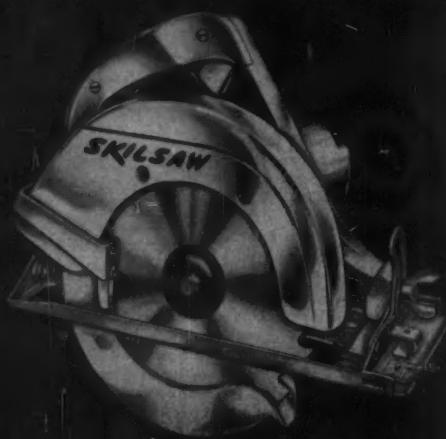




super-duty SKILSAW—In-line rear handle and left-hand blade allows you to see line of cut. Exclusive hi-torque worm drive gives exceptional cutting power. Tough to stall anytime. Super duty saws with rear handle design come in eight models from 6½" to 12".



super-duty SKILSAW—Completely new top-handle design for easy "swing-through" cuts. "Floating" blade guard and fast blade-change are exclusive new features. A total of 14 special features which add up to the most exciting new saw on the market today. Top-handle design available in 7¼" and 8¼" models.



heavy-duty SKILSAW—Designed specifically for all-around use by carpenters or contractors in residential construction. Lightweight. Versatile. All heavy-duty models feature exclusive "Vari-Torque" clutch. Protects against blade kickback. Keeps motor in top running condition. There are five heavy-duty models with blade sizes from 4½" to 8¼".

WHICH SKIL SAW

works best for you?

more proof of **SKILMANSHIP***
ONLY SKIL MAKES ALL THREE

For more than 30 years SKIL has pioneered in the design of saws to meet the special needs of builders. Now, we offer the widest choice ever with the addition of a top-handle saw. Only from SKIL can you choose from three types. And remember this —no matter which model you buy, you always get the same superior performance that has made SKIL saw the favorite saw in the building field.

***SKILMANSHIP** is the ability to offer the finest portable saws for over 30 years—saws that do any job better, faster, easier.



Made only by SKIL Corporation, manufacturer of famous SKIL and SKILSAW products, 5033 Elston Avenue, Chicago 30, Illinois. In Canada: 3601 Dundas Street West, Toronto 9, Ontario.

INTRODUCING.....

Compacts earth fills and all courses of flexible-type pavements: sub-base, base, surface materials

Variable-weight wheel loads (3340 to 8600 lbs. per wheel) to suit various materials and density requirements

Broadening its line into the field of pneumatic tire compaction equipment, Buffalo-Springfield brings you "years-ahead" features in a big, 7-wheel, self-propelled roller . . . the 10-30 ton PSR-30.

You get *positive 4-wheel drive*. Twin propeller shafts (one to each pair of drive wheels) transmit power from *bevel gear differential* to final drive case at wheels. All wheels oscillate for contour compaction. Smooth, infinite speed changes up to 19.4 m.p.h. in either direction are controlled by hydraulic power shifting and full reversing through 3-range transmission, and torque converter. Other features: 4-wheel hydraulic brakes with air booster, power steering, dual controls and swivel seats at both sides . . . and a good view of guide and drive wheels from either operating position!

For more details on this advanced new PSR-30 . . . and other types of compaction equipment . . . your Buffalo-Springfield® distributor is the man to see. Call him today.

BUFFALO - SPRINGFIELD
ROLLER COMPANY • SPRINGFIELD, OHIO

A division of Koehring Company



8500

PNEUMATIC TIRE • VIBRATORY • SEGMENTED ROLLERS • 2 AND 3-AXLE TANDEMS • 3 WHEEL ROLLERS • KOMPACTOR

a NEW development in pneumatic tire rollers



97 TO 98% DENSITY ON ASPHALTIC CONCRETE — A mixture of coarse and fine mineral aggregates and asphalt cement was placed in 1½" lifts to resurface highway. State specifications of 95% density were met and exceeded by this Buffalo-Springfield PSR-30. It was ballasted to a total weight of 42,000 lbs. (6,000-lb. load on each wheel) — and supplemented "break-down" and "finish" rolling on this job.



COMPACTING BANK-RUN GRAVEL — All courses of classified materials for flexible-type pavement were compacted by this PSR-30, ballasted to 56,000 lbs. (8,000-lbs. per wheel). Courses consisted of: 2 layers of sub-base bank-run gravel, compacted to 9" . . . 8" waterbound macadam base course, in 2 lifts . . . a 3" bituminous macadam base course . . . 2½" asphaltic concrete base course, and finally a 1½" asphaltic concrete surface course.

NEWS about a bigger-than-ever

Presenting...
2 NEW CRANES



**35-TON
435 TRUCK
CRANE**

Big, heavy-duty . . . with plenty of load-stability on or off-pavement . . . new Koehring® 435 truck crane safely lifts up to 35 tons, with 40-foot boom at 15-foot radius (based on 85% rating). Removable counterweight, boom, outriggers reduce weight well within highway load-limits.

Quick facts on KOEHRING WORK CAPACITY:

MODEL ON RUBBER	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
330	3-axle truck	60,000 lbs.	at 15-ft. radius
435	4-axle truck	70,000 lbs.	at 15-ft. radius
545	4-axle truck	90,000 lbs.	at 15-ft. radius

ON CRAWLERS	Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
305	1/2 Cu. Yd.	30,000 lbs.	at 10-ft. radius
305	5/8 Cu. Yd.	30,000 lbs.	at 12-ft. radius
405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
545	(Crane only — 85% rating)	50,000 lbs.	at 12-ft. radius
605	1 1/2 Cu. Yd.	72,000 lbs.	at 12-ft. radius
805	2 Cu. Yds.	104,000 lbs.	at 12-ft. radius
1205	3 Cu. Yds.	150,000 lbs.	at 12-ft. radius

**30-TON 330
TRUCK
CRANE**

Now, meet the new 330 truck crane (below) . . . latest addition to the big Koehring line on rubber . . . with 30-ton lift capacity . . . 30 to 120 feet of main boom, plus 15 to 30 feet of jib. Power-lowered A-frame removes the counterweight for highway travel . . . same system speeds re-assembly at next job.

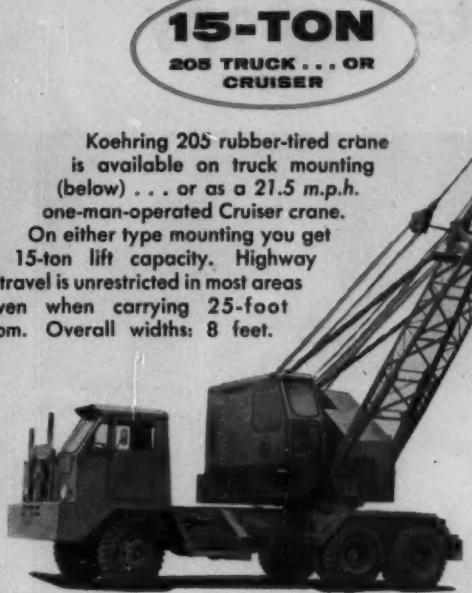


KOEHRING
HEAVY DUTY

Koehring fleet.....ON RUBBER

15-TON
305 TRUCK . . . OR
CRUISER

Koehring 205 rubber-tired crane is available on truck mounting (below) . . . or as a 21.5 m.p.h. one-man-operated Cruiser crane. On either type mounting you get 15-ton lift capacity. Highway travel is unrestricted in most areas even when carrying 25-foot boom. Overall widths: 8 feet.



25-TON
305 CRUISER® CRANE

One man controls all operations . . . one engine supplies all power for work and travel on Koehring 3-axle 305 Cruiser crane (below). It safely lifts up to 25 tons. Travels at speeds up to 18 m.p.h. . . . has smooth, torque-converter drive . . . automotive-type power steering . . . and short 27 foot-9¾ inch turning radius. Gradiability: 28%. Booms: 30 to 100 feet, plus 15 to 30-ft. jib!

25-TON
305 CRUISER® CRANE



Here's another heavy-duty, high-reach crane worth looking into . . . a truck-mounted 305, that raises up to 100 feet of main boom (or 130-foot boom-and-jib) with low A-frame! It's a 25-ton capacity crane with clamshell, dragline, shovel, hoe versatility.

45-TON
545 TRUCK CRANE



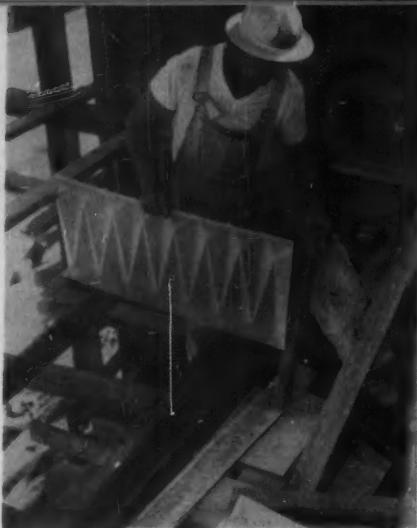
With this big, truck-mounted 545, Koehring now brings you 45 tons of lift capacity . . . plus quick conversion from fully-equipped machine to roadable machine.

K906

Pick the size that suits YOU . . . then call Koehring distributor today for a demonstration.

KOEHRING DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN



READY—workman carries a section of plastic form liner up to staging in the canopy.

SET—Liner form is placed against outside plywood form that will serve as bracing.

Plastic forms cut two-thirds from the cost of casting ornamental concrete in place. That's the experience of one contractor in California.

PLASTIC FORM LINERS are an inexpensive substitute for plaster molds in ornamental concrete work.

They cut forming costs by one-third on a cast-in place concrete girder canopy for a cement plant in Crestmore, Calif.

Architects gave their imaginations free reign when they designed a \$661,000 office and laboratory for the Riverside Cement Co. The two-story structure features a whole host of new building materials and shapes. But the shape that most bothered Twaits-Wittenberg Co. of Los Angeles, the contractor, was an ornamental cast-in-place girder canopy 160 ft long that runs along the top of the building's facade.

These shapes usually are cast by placing female form sections molded from plaster into place, pouring concrete, removing the forms, then destroying them unless there is a future use.

For this job, the contractor made forms to the specified canopy design from thermoplastic sheets molded from U.S. Rubber Co.'s Lustreform 2900. Twaits-

Plastic Form Molds Concrete Canopy



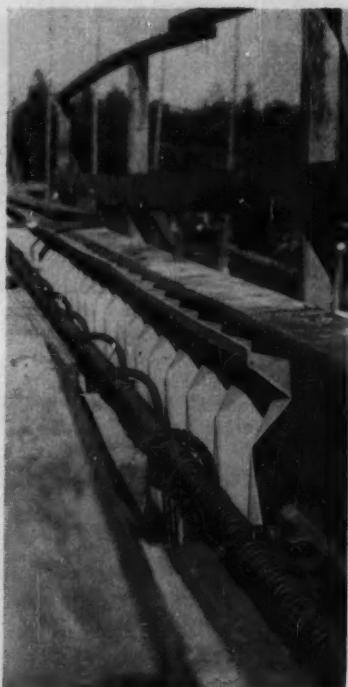
Wittenberg made 65 liners. Each measured 16x32 in. and weighed 3 lb. The plastic molds cost \$1.25 psf as compared to \$3 for plaster.

Placing the forms was easy. Workmen first erected a plywood bracer form over a plywood soffit. Then they took the plastic liners and taped them end to end along the inside of the liner with a strong adhesive. After setting a length of reinforcing bar along the canopy length, the workmen erected the inside plywood form.

Forms were braced, and the canopy was cast with a lightweight concrete to keep the unit weight of the structure low. Concrete on this job had a mix that contained six bags of cement for each cubic yard of concrete.

Stripping the full 160-ft length of form took 30 min. Workmen then washed the liners with clear water and rubbed them down with cloth to preserve them.

Once forms were stripped workmen washed the surface of the canopy down with a 5% solution of silicone. This process will be repeated every two to five years to protect the surface.



GO—Section of liner in place complete with reinforcing rod awaits concrete.

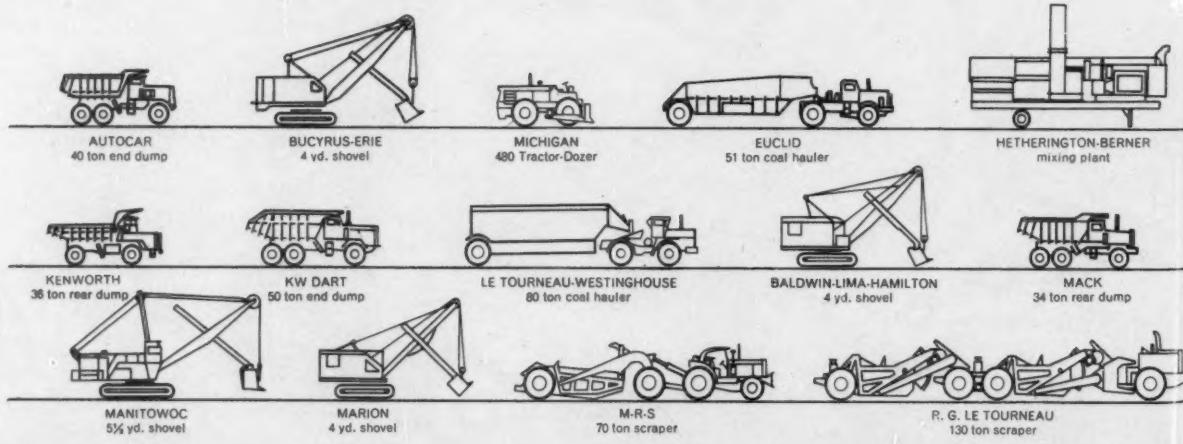


PROVEN **CUMMINS**
POWERED
GIANTS
EARN MORE
PROFIT!



Proven by 10 years of on-the-job performance...

CUMMINS 450 AND 600 h.p. V-12 DIESELS UP



Nothing
Diesels.
When
able yo
per ho
cut the
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Cumm
10 year
develop
Wet ty
less co
trouble
protect



UP PRODUCTION WHILE REDUCING COSTS

Nothing can match the performance of Cummins V Diesels—the 450 h.p. NVH-12 and the 600 h.p. VT-12! When powering today's giant earth-movers, they'll enable you to handle as much as five times as many yards per hour as equipment with less powerful engines. You cut the number of units needed—reduce driver wages—minimize maintenance and repair problems.

Cummins has proven these 12 cylinder models through 10 years of on-the-job performance. Continuous engine development has produced features that save you money. Wet type cylinder liners, for example, permit quicker, less costly repair. The PT Fuel System is fool-proof and trouble-free. Cummins Dirt Proofing provides positive protection against the entrance of grit and abrasives.

If you are considering the purchase of new, larger equipment, like the scraper shown above, specify it with Cummins V-12 power. This means you'll start earning more profit right away. To aid you in selecting, the NVH-12 or the VT-12 is standard or optional power in the machines shown to the left. For more details, see your manufacturer's representative or Cummins Distributor.

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MORE PROFIT

gives you the big plus



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FOR MORE PROFIT

• **CUMMINS SERVICE IS WORLDWIDE**

There are more than 350 service points throughout the world. Just call the Cummins man near you—anywhere in the United States and Canada—for parts and service.

• **CUMMINS DIRT PROOFING**

Air cleaners, caps, connections, the oil system and all entrance points for destructive dirt and grit are made dirt-proof by Cummins proven protective system.

• **CUMMINS 2-INSPECTION PROGRAM**

Off-highway applications are double checked—inspected before delivery and on-the-job, in the machine. This protects your power investment and assures long operating life.

• **COMPLETE RANGE OF DIESELS**

34 models—from 60 to 600 h.p.—enable you to have Cummins power for any application. Your distributor can also repower your present machine, if you wish.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

INTERNATIONAL SALES & SERVICE — CUMMINS DIESEL INTERNATIONAL LTD., NASSAU, BAHAMAS — CABLE: CUMNAS
OVERSEAS FACTORY — CUMMINS ENGINE COMPANY LTD. — SHOTTS, LANARKSHIRE, SCOTLAND



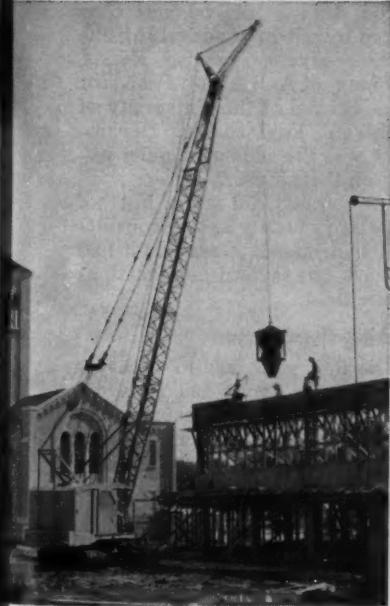
TRENCHING THROUGH QUICKSAND

Orfei & Mariani and Sons, Inc., St. Paul general contractors, encountered excessive water and quicksand on a sewer job. They put their American 700 Series Dragline—with 2½-yd. bucket—on the job . . . trenched down 50 ft. while dewatering the area. Then, working through a cassion, the American clamshelled to grade—added a gravel support base and set the 48" pipe. "We're very satisfied with our Americans," says Geno Orfei. "A real machine—best brakes I've seen," says operator John Schadow. Americans prove their performance and efficiency on tough excavation and construction jobs . . . capacities start at ½-yd., 12½ tons!

PERFECT CONTROL of the American 300 Series Cranes keeps heavy material moving fast . . . jobs on schedule! American Crawler and Truck Cranes accommodate all fronts—provide the right capacity for your job. Get all the facts on a complete crane-excavator line from your nearby American distributor—he's on call!



Orfei & Mariani used an American 100 Series Truck Crane to jet in the well points required to dewater the area. Low boom operation permits long reach. Operator Robert Cofield says the American, "... handles real nice—very easy to operate." American simplicity gives owners high production with low initial and upkeep costs.



EXCAVATORS-CRANES
to 2 yds.-55 tons
LOCOMOTIVE CRANES
to 130 tons
DERRICKS-HOISTS
to 800 tons
REVOLVER CRANES
to 400 tons

AMERICAN HOIST

and Derrick Company

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AMERICAN HOIST
PACIFIC COMPANY
Special materials
handling equipment

CROSBY-LAUGHLIN
DIVISION
Drop forged fittings
for wire rope-chain

To sink an open caisson without disturbing the inside earth core, a Detroit contractor tried a unique method. He formed 30-in. vertical holes in the wall of the caisson itself and augered out the soil under the cutting edge. The weight of the caisson forced earth to flow into the holes.



CUTTING EDGE—Crew lays first section of cutting edge on sand in 20-ft deep open pit. After walls reach 30-ft height, crane will remove timbers so caisson can sink.

Augering Through Holes in Wall

SINKING A BIG CAISSON is a tricky job under any conditions. When you're experimenting with a new system of sinking it, the headaches can pile up.

Louis Garavaglia Contractors, Inc., of Warren, Mich., have just completed one of the toughest caisson jobs they ever tackled. They ran into some unexpected problems. But they managed to solve them all. And in the process they contributed some new know-how to the art of caisson construction.

The caisson is an open circular type, 97 ft deep and 108 ft outside diameter, with concrete walls 7 ft thick. It will house four high capacity pumps to form a booster pumping station for a raw water tunnel in Detroit's water system.

Many of the construction problems stemmed from the fact that Garavaglia was trying out a unique method of sinking the caisson. They formed holes in the wall of the caisson itself, through which they excavated only the ground under the cutting edge. The idea was to leave undisturbed

the earth both inside and outside the caisson while it was sinking.

Soil conditions and the nearness of a main raw water tunnel were the main reasons for the new technique. The new pumping station, of which the caisson is a part, is located on a bypass tunnel parallel to, and only 52 ft away from, the main tunnel. The main tunnel is 50 ft underground.

The normal practice in sinking an open caisson is to excavate the core of earth inside the caisson walls. This allows the weight of the caisson to sink it farther into the ground. More core is excavated and the process continues until the caisson reaches the required depth.

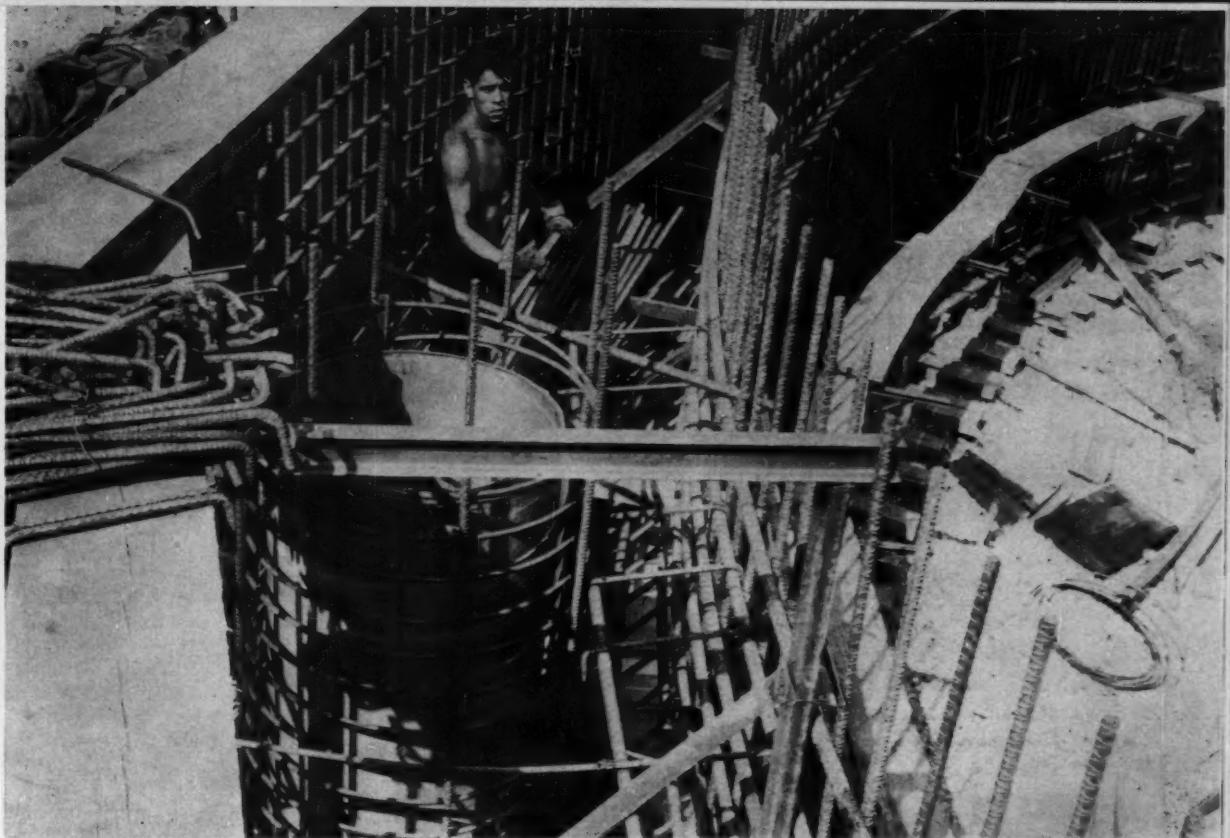
In this case, waterworks engineers figured that the clay soil outside the caisson might flow under the cutting edge into the caisson as the central core was removed. They feared that this earth movement would damage the main tunnel. So they specified that the inside earth core must remain undisturbed while the caisson was sinking.

The sinking method was conceived by a firm of consulting engineers—Ayers, Lewis, Norris, and May, of Ann Arbor. Professor W. S. Housel of the University of Michigan Engineering Department was the soils mechanics expert on their staff.

The method did work, but not quite as smoothly as the consultants had hoped. Garavaglia had to work out several modifications in the field.

Sinking the Caisson

The first step was to excavate an open pit about 190 ft in dia and 20 ft deep. The caisson was started from this point. Garavaglia built the caisson's steel cutting shoe on a temporary foundation of timbers bedded in sand. The cutting edge of the shoe was shaped like inverted steps with each step 2 ft wide. Evenly spaced around the circumference and passing through the shoe, were fourteen 30-in. dia holes through which the earth was excavated. These holes were formed with Sonotubes in the concrete caisson



EXCAVATING HOLES—Key to method is series of 30-in. holes formed right in the wall of the caisson. Earth under cutting edge is

excavated through these holes without disturbing core of earth inside caisson. When caisson reaches final elevation, holes are plugged.

Sinks Big Caisson

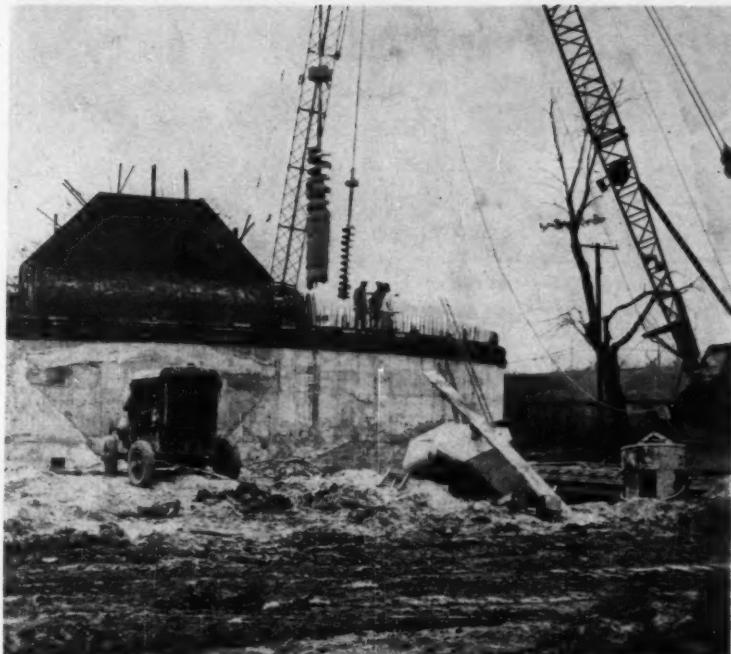
wall and extended from the bottom of the shoe to the top of the caisson.

With the shoe formed, Gavariglia started the caisson wall, using Economy steel forms. When the wall had been concreted to a 30-ft height, a crane pulled the timbers from underneath the caisson, allowing it to start sinking into the clay. The structure weighed about 5,000 tons at that stage.

To prevent underground water from shifting earth away from the main tunnel, Intrusion-Prelakt Inc. drilled into the soil around the caisson and injected a chemical grout.

The concrete crew built up the caisson walls in 10-ft lifts, pouring about 800 cu yd at a time. At the same time, three cranes carrying electric-powered Kamo augers excavated the clay through the holes in the walls.

Only the clay directly under the caisson moved, and it flowed into the holes where the augers could remove it. The augering itself was slower than expected



AUGERING—Crane-mounted electric auger removes clay through holes as weight of the caisson forces clay into holes. Crews remove sticky clay from auger with hand shovels.

AUGERING SINKS BIG CAISONS . . . continued



DEWATERING—Wellpoint system around caisson will remove ground water during excavation of caisson core. After interior core is removed, sump pump handles seepage.



EXTRA EXCAVATION—At 65 ft depth contractor had to auger an extra row of holes inside caisson wall to keep caisson sinking. Shortly afterwards he removed entire core.

because the clay stuck to the augers and had to be cleaned off with hand shovels.

When the caisson reached a depth of 65 ft the plasticity of the earth proved less than expected and the clay did not flow into the holes. To keep the caisson sinking, Garavaglia had to auger an extra ring of holes just inside the wall. This kept them going until they were 20 ft from final grade.

At this point the cutting edge was well below the level of the main tunnel and the engineers

figured it would be safe to remove the caisson core. Three clamshells with a combined capacity of 5 cu yd excavated the clay and the caisson continued to sink to final grade.

For the first 50 ft of core excavation Garavaglia controlled ground water with a Moretrench wellpoint system. Then they formed a sump inside the caisson and pumped out the water. The seepage rate was about 7 gpm.

Garavaglia found that the augering method gave them excellent control over the caisson. If it

started to tilt they could easily straighten it by extra augering under the side that was sinking too slowly.

The final elevation was only 1½ in. off the specified grade; the contract had given them a leeway of 2 ft. And the structure was only 4 in. out of level.

With the caisson at final elevation, Garavaglia formed a 24-in. sump to keep the interior dry while they poured a 9-ft thick floor.

It took over 2,000 yd of concrete in one continuous 20-hr pour to do the job. They left the sump pump working during the initial set to prevent upward pressure on the concrete. Then they allowed water to come in and cover the new concrete to aid curing. A separate permanent sump and pump was installed to control future ground water pressure.

Complications

The main raw tunnel on one side of the caisson was the biggest problem during the sinking. But there was another complication on the other side. A canal for pleasure craft runs close by the caisson and there was some possibility that it might be undermined.

This was easier to handle than the tunnel because the canal was on the surface. Garavaglia simply drove a shield of sheet piling between the canal and the caisson. They sank the sheeting well below the level of the canal bottom so there was no chance of dangerous earth movement.

The raw water tunnel booster station, located in Detroit's Water Works Park, is part of a major expansion program in the city water system. It will double the capacity of the raw water tunnel to nearly 1,000,000,000 gal per day. The completed booster project will cost about \$5.5 million and is scheduled to go into service in 1960.

Men on the Job

James H. Marks, chairman of the board and chief executive officer of Garavaglia, has overall supervision of the job for the contractor. Burton Stover is general superintendent in the field for Garavaglia.

Gerald Remus is chief engineer for the Detroit Water Board. J. Lockwood is chief engineer of Water Works Park.

HOW A CLAM-ACTION 4-IN-1 obsoletes "straight bucket" rigs ...ON JOBS LIKE THESE!



Back-dragging with clamshell action, this TD-9 4-in-1 dredges silt from under a new bridge while a big boom-type clamshell is forced to stand idle in the background. The operator can also use back-drag action along with powerful Skid-Shovel excavating action to speed this job in tough digging. "The 4-in-1 is the best money-saver the county has," states Art Hahn, Colfax County, Nebraska, commissioner. "For ditch clean-up or culvert work, you can't beat it!"

In quarters too narrow to maneuver, simply use the 4-in-1's clamshell action. You can load loose materials without moving the tractor with a fast, one-gulp clam-fill. Even on jobs like clean-up, you get the advantages of a big-capacity outfit; practically eliminate the need for costly hand labor. Move the "machine-selector" lever with 2-finger ease, to get clamshell, or any other 4-in-1 action! Fessenden and Co., El Curito, Calif., owns this TD-9 4-in-1!



Grading with back-drag motion, this TD-9 4-in-1 is shaping a bank ahead of landscaping and paving around a new filling station. "The 4-in-1 can cut such a fine grade we don't need to follow-up with a grader," reports Ray Sims, for Meridian Pavers, Seattle, Washington. "It digs and loads faster than any comparable unit, takes out concrete slab, enables us to take on work an ordinary loader can't handle!"

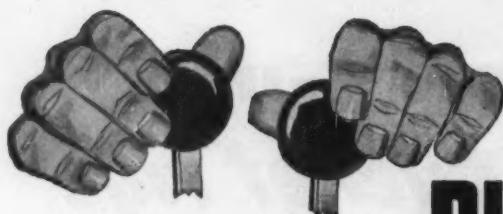


Try versatile International Drott 4-in-1 clamshell action from back-dragging to grading or excavating—to clean-up in tight quarters or for speedy stockpile loading. Then try super powerful 4-in-1 pry-over-shoe break-out action. Lift the clam lip (hydraulically) and see what big-capacity dozing you command—with 4-in-1 dozer action. Prove to yourself that 4-in-1 clamshell action obsoletes any old-fashioned "straight bucket" loader on the market. See your International Drott Distributor for a demonstration.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL
DROTT •



Your operators' fingertips can
control this greater dozing capacity

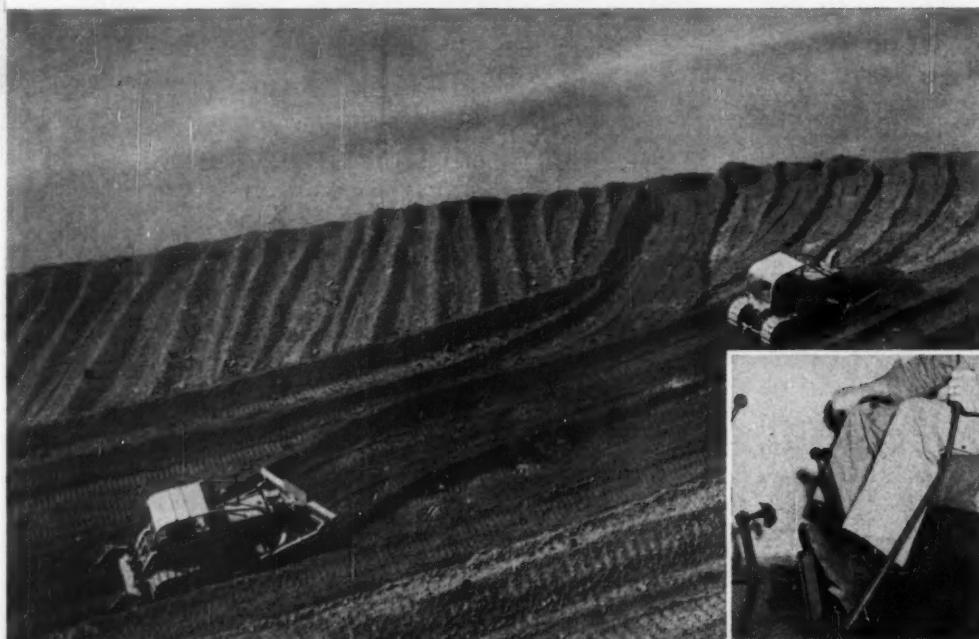
Planet-Powered "24's" do



UNMATCHED FOR BENCHING, SIDE-CASTING

The TD-24 outproduces comparable crawlers on benching or side-casting without "noseing" into the bank, loss of working speed or traction—despite side-draft of offside load. TD-24 operator counteracts rear-end "slewing" by operating the load-side track in high speed-range while keeping the outside track in low range. This exclusive separate, power-on-either-track feature provides bonus load follow-through. Operators of king-size steering-clutch crawlers, by contrast, must release the steering clutch on the outside track to keep tractor pushing forward. This kills half the productive power and traction!

With hand you 50%, tors. E fast re TD-24 compet Ben blading keeps doesn' "jerky" your o tracks— "dead-t from sh Your by shi flicking fingers Lo plan At t



CYCLE SHORTENING FASTER REVERSE SPEEDS

Faster reverse speeds let the TD-24 operator cut cycle time and boost production on shuttle-dozing, especially on long pushes. At the end of the pass, TD-24 operator depresses the decelerator pedal, and quickly shifts to a fast reverse speed. As he highballs back for another pass, he uses Hi-planetary shifting as needed to speed repositioning the "24" for the next pass.

Doze up to 50% more paydirt!

With **two-finger ease** your operators can hand you a paydirt dozing dividend of up to 50%, on International TD-24 crawler tractors. Exclusive Planet Power steering, plus fast reverse speeds up to 7.5 mph, arm the TD-24 operator to outblade steering clutch competitors by amazing margins!

Benching, bank-cutting, side-casting, or blading around the curve, the TD-24's dozer keeps cutting—keeps paydirt on the move—doesn't spill the extra-profit margin with "jerky" steering. Planet Power steering gives your operator full-time "live" power on both tracks—eliminates load-losing, power-wasting "dead-track drag" in turns—clips vital minutes from shuttle-dozing cycles!

Your operator "pours on" full-load power by shifting the TD-24 into first gear and flicking steering levers into low range. Two fingers can then instantly power-shift the Hi-Lo planetary into load-matching high range!

At the end of the pass, your TD-24 opera-

tor presses the engine decelerator for quick-shifting to fast reverse, zips back for another pass. Hi-Lo planetary levers give two separate speeds in any forward or reverse gear selected!

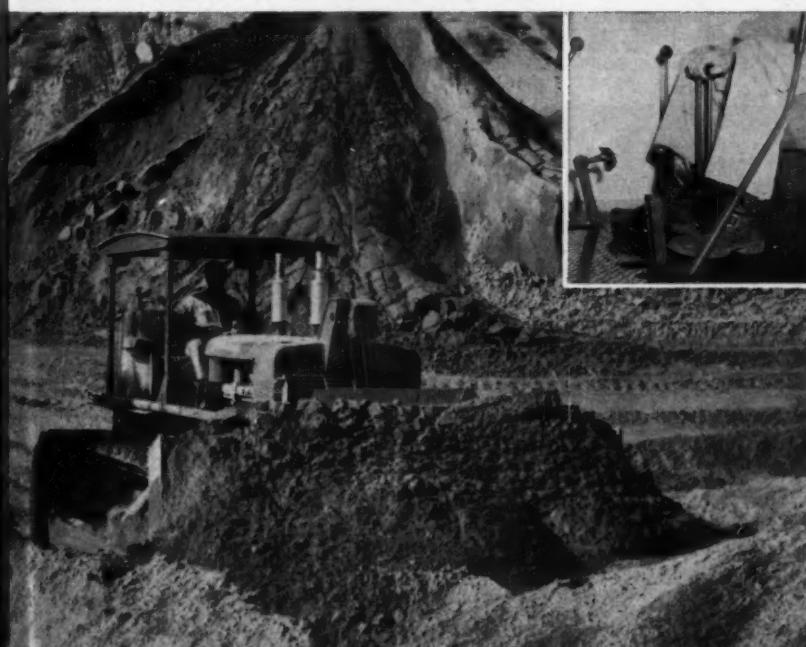
Prove to yourself how your operators can boost dozing dividends at the controls of Planet-Powered "24's." And measure the production advantages of "24's" as pushers or pull-type scraper power. Call your International Construction Equipment Distributor for a demonstration!



**International®
Construction
Equipment**

International Harvester Co., 180 North Michigan Avenue

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



PAY-OFF STRAIGHTAWAY PUSHES

This whopping bladeful of wet sand is dozed fast by the TD-24 operator who: 1) shifts on-the-go into first gear forward, by using the synchromesh transmission; and 2) utilizes instant-shift Hi-Lo planetary system of flicking levers into low-range position. As load lightens, operator power-shifts into high-range position, increasing working speed 27%! Decelerator pedal provides for "no-hands" slow-ups!

These are the profit-proverfe that lead to Payhauler® fleetwo

Look into the rock-lugging, grade-beating 24-ton "95"...

- **Bonus-powered**, with a 335 hp high-torque turbo charged diesel engine to beat steep grades and high altitudes with full payloads!
- **Your choice of torque converter** with powershift, or 9-speed constant mesh transmission. Speeds to match every load and road.
- **Shock-cushioning** of planetary drive axles.
- **Massive frame stamina**—with 277 lbs. of high-strength, shock-resisting steel for each rated ton of carrying capacity.

- **Springs with extra leaves and extra length** to cushion the payload, smooth the ride.
- **Positive power-steering, Torqmatic braking, panoramic vision**, for unmatched operating ease and load-speeding safety.
- **Up to 25% higher hauling speeds**—the "95" can haul, fully loaded, up to 38 mph.
- **Faster reverse speeds**—for spotting to load, or positioning full loads for dumping. The gear-drive "95" can travel up 7.1 mph. in reverse.
- **9-second dumping**—another cycle-speeding feature.

...and the 250-hp, 18-ton "65" has equally outstanding features.



International® Construction Equipment

International Harvester Co.
180 North Michigan Ave., Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers and Bottom Dump Wagons... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

Power for steep grade climb-outs wins steady job for five "65's"

Bonus Turbo Charged Diesel power to deliver extra-tonnage loads up a haul road with a 17% average grade accounts for the dependence of Caldwell Engineers on five "65" Payhaulers—on the \$13 million hydro and flood-control Oliver Dam, Columbus, Ga.

Contractor doubles load delivery speed with positive Torqmatic braking!

Central Pennsylvania Quarry and Stripping Co. credits the market for the success of their 5-unit "95" Payhauler fleet with doubling load delivery speed—by increasing safe downhill hauling speed. They've compared "95's" directly to other off-road equipment on rock-hauling duty!



features ownership!

Prove what it means to command the Payhauled ratio of power to payload—for hauling up to 25% faster; beating grades and altitude. Try Payhauled “pick-up-truck” spotting ease—“zip-around” power steering—exclusive high reverse—and all the other Payhauled advantages. See your International Construction Equipment Distributor for a demonstration!



high-percentage availability proves built stand-up-ability!

8.5 work availability through one measured 12-week period—the mark set by a 10-unit “95” Payhauled fleet—high-ballasting rock over steep High Sierra grades, on mammoth Pool Hydro project, for Southern California Edison Co. Such records result from reserve power, reserve frame and transmission strength, and reserve shock-resistance!

Another thirty “95” Payhauleds join Merritt-Chapman and Scott fleet!

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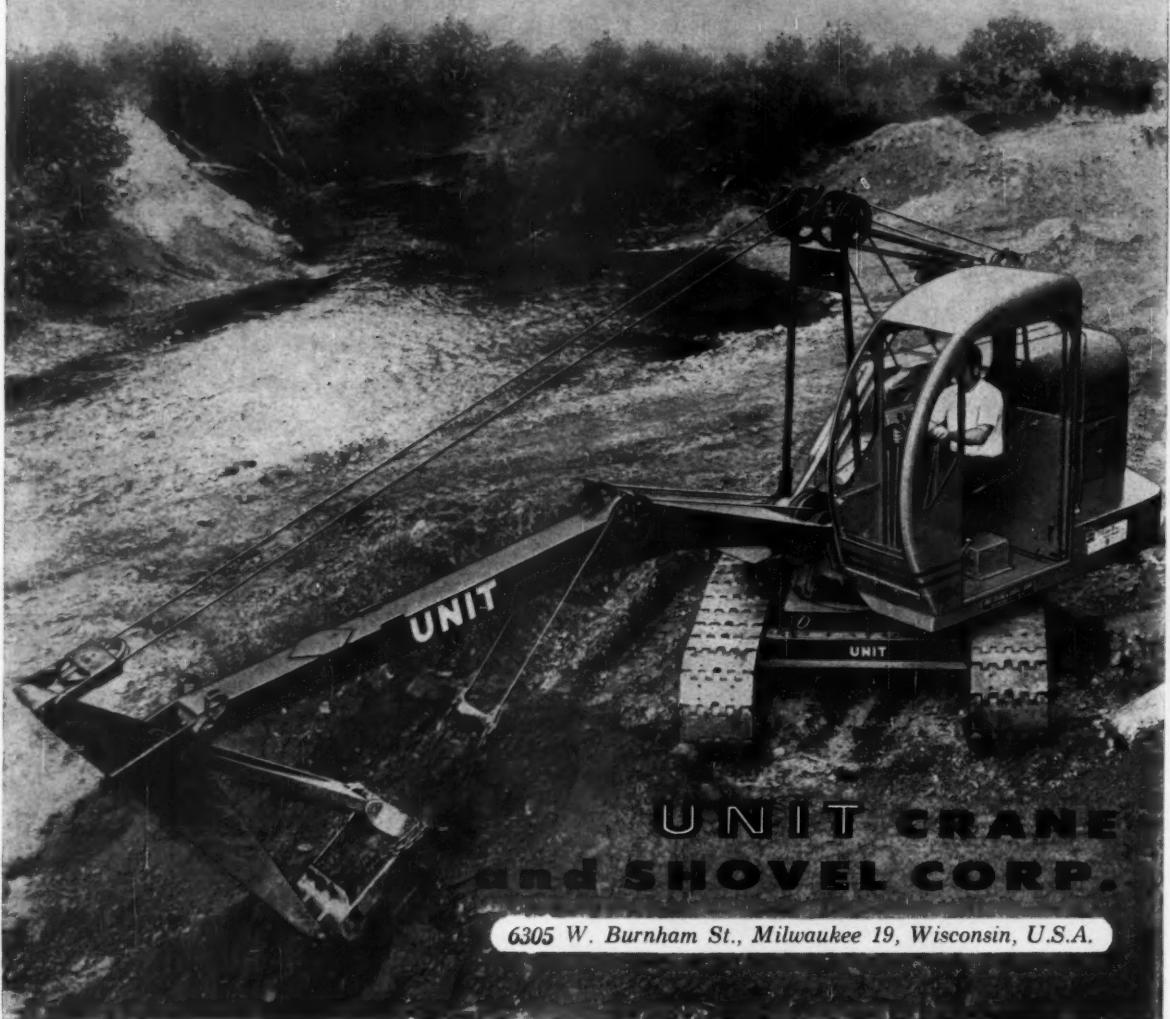


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EARTHMOVING—Cat bulldozer cuts into hogback ridge. Scrapers haul material an average of 1,500 ft across Bailey span to low-lying fill area across the river.

A Minnesota contractor started a road relocation job by putting a Bailey bridge across the river that split the site. With the bridge in place, equipment could move back and forth across the river to any part of the 0.6-mile-long job site.



BAILEY BRIDGE—Loaded Cat scraper moves cautiously across Bailey. Speeds were limited to 4 mph to avoid undue stress in bridge. Scraper weighs nearly 57 tons.

Bailey Bridge Opens Up Road Job

A BAILEY BRIDGE was the key to efficient operations on a highway relocation job in Minnesota. The relocation was only 0.6 mi long but it was split in two by the Minnesota River. The Bailey linked the two sections and allowed earthmoving equipment to move freely to all parts of the job.

Brown and Leguil Construction Company of Mankato, Minn., had a \$326,000 contract to construct a four lane relocation of Highway 169 near LeSeuer, Minn. The site was a rugged one—a 500-ft wide swamp crossed the road at one point and a "hogback" ridge with a 22% grade crossed it near the end of the section.

But the river that split the job was the basic problem. Another contractor, Al Johnson Construction Co. of Minneapolis, had a contract to build a 1,100-ft concrete bridge over the river, but they were not scheduled to start work until Brown had finished the earthmoving. So Brown had to devise a temporary crossing.

First they tried to place a submerged rock fill in the river so the equipment could ford the stream. But washouts forced them to abandon this method.

Then they obtained the Bailey equipment from Schultz & Lindsay Construction Co. of Fargo, N. D. on a rental basis. They spanned the 60-ft river with a

125-ft Bailey bridge, continuous over a single timber pile pier in midstream.

They used five single-story Bailey trusses side by side for the main structure and 3-in. oak planking for the deck. Brown crews erected the bridge with a 2½-yd Manitowoc crane. They pulled it into place with a Cat crawler tractor.

The bridge had sufficient strength to allow a heap-loaded DW21 weighing 57 tons to cross. As a precaution against setting up unnecessary stresses in the bridge, the machines slowed to about 4 mph while crossing. About 20 loads per hour were hauled across the span in addi-

BAILEY BRIDGE OPENS UP ROAD JOB . . . continued

tion to the empty machines that passed over it on the return trip.

Since earth was moved on two shifts of 8 hr each, eight 500-watt floodlights were installed, two on each corner of the bridge, to illuminate the floor. A Universal 6000M 5-kw gasoline powered generator supplied the electricity.

With the Bailey bridge in place, earthmoving equipment could move back and forth across the river to any part of the job. But the river still was not com-

pletely conquered.

It is normally a passive river. But heavy rainfall can cause rapid swelling, especially at this site where the natural width was only 60 ft.

To overcome this tendency, the contract called for Brown to excavate a 3,500x250-ft overflow channel. Excavation involved was about 400,000 cu yd, most of it being used to build up slopes and shoulders on the sides of the channel.

Most of the channel excavation was wet silty sand that was difficult to load and move. Brown used a Manitowoc 2½-yd dragline, but they had to set it up on timbers to provide adequate flotation. The dragline loaded Cat DW21-No. 456 scrapers that hauled the material away. In some of the drier portions of the cut a Cat D9 tractor was able to pushload the scrapers.

Where the swamp crossed the road, a dragline removed an excavation 500 ft long, 200 ft wide, and 15 ft deep. Unsuitable material excavated from the swamp was replaced with 71,000 cu yd of gravel hauled in nearly half a mile by truck.

Zaske Construction Co. of Morton, Minn., subcontracted this phase. They dozed the gravel from a pit beside the roadway with two Cat D8's with U-dozers and one Allis-Chalmers HD-16 bulldozer. Six International tandem rear dump trucks handled the hauling. Working two shifts per day, six days per week, Zaske's 26-man force moved an average of 7,000 cu yd per day.

The hogback ridge, running for a distance of 500 ft within the bounds of the road, had to be removed. In its natural state the ridge formed a 22% grade. Cat D8 bulldozers made the initial cut. Then DW21 scrapers, assisted by the D8's, removed 152,000 cu yd of borrow to bring the hill down to grade.

For night operations, a truck-mounted Katolight 2,000-watt generator supplied power for four 500-watt floodlights at the cut. A 4.5-kva Marquette JG-200-L generator supplied power for shops and offices.

Compaction of the subgrade was 95%, except for the last 3 ft which required 100%. A Cat D4, a D7, a John Deere farm tractor, and four DW21 tractor units pulled the compaction equipment which included two sheepfoot rollers, two Vibrapac Model 60's, and a 13-wheel roller. Two Cat No. 12 motor graders shaped the fill and handled final grading.

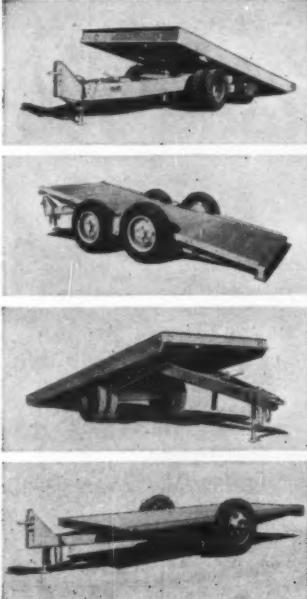
The job took 160 working days to complete. Brown and Leguil employed 12 men per shift, two shifts per day, six days per week.

D. L. Ryan was project superintendent for Brown and Leguil. Lyle G. LaFavor was project engineer for the Minnesota State Highway Department.

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The R. Sam Krage Company operated 58 pieces of equipment on the Nebraska Interstate Highway, all using Phillips 66 heavy duty motor oils, greases and gasolines exclusively. The company was started by R. Sam Krage with one bulldozer and scraper.

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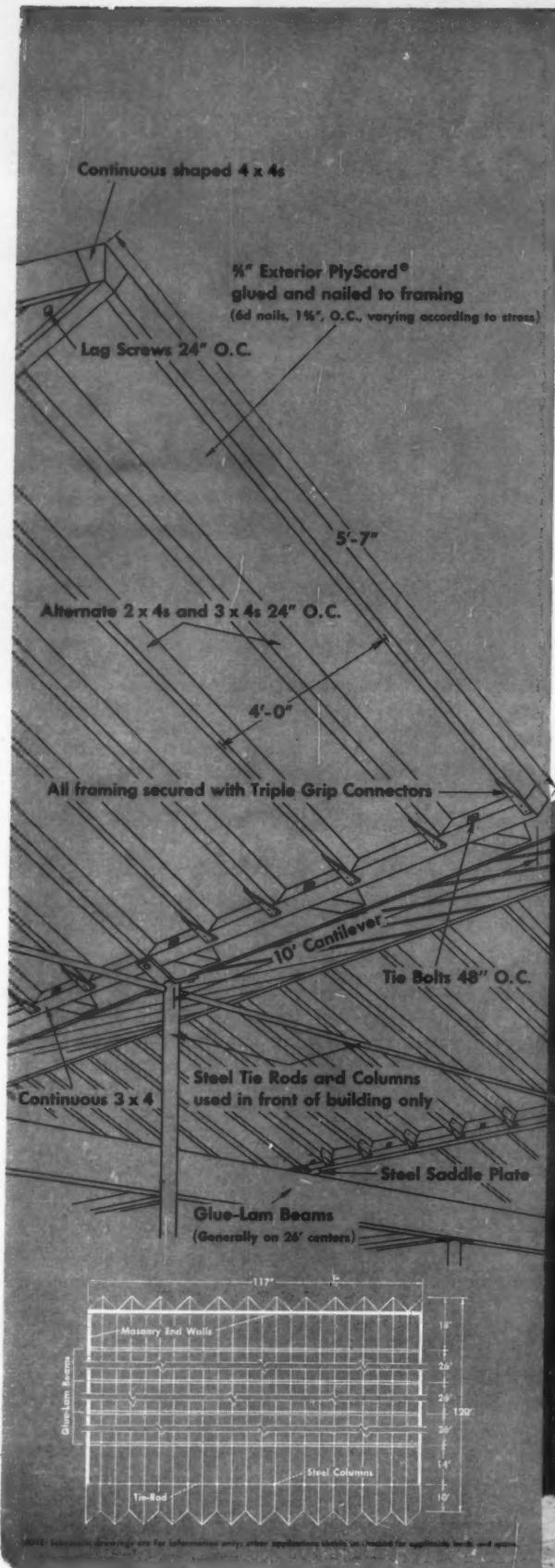
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New low-cost f covers 1



Page 122 — CONSTRUCTION METHODS and Equipment — January 1959

First fir plywood folded plate roof covers 14,000 sq. ft. in only 9 hours

Fabricated on the job with common labor, new roofing system costs 10-20% less than conventional construction—provides attractive appearance, superior structural values.

THIS PRECISELY ENGINEERED folded plate roof—the first of its kind using lumber-framed plywood sections in series—offers several unique advantages:

Low cost and fast job-site assembly using common labor. Plywood components were installed by a 6-man crew in less than nine hours. Total costs, including all labor and materials, came to less than 80c per square foot—a figure some 10 to 20 percent less, locally, than joist or truss construction accomplishing the same clear floor area.

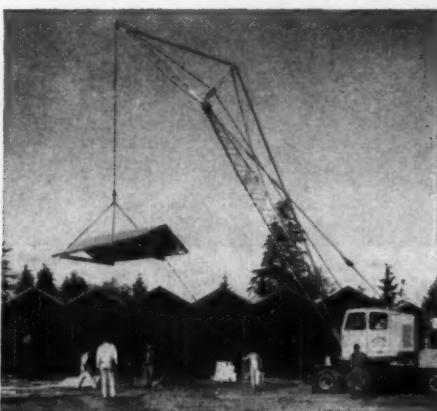
Structural simplicity. The roof consists of 11 plywood folded plates which rest on four glue-lam beams.

Each of the inclined planes is a rigid plywood diaphragm, paired to form a giant self-supporting inverted V-beam which spans 10 feet from valley to valley and 26 feet from beam to beam. Posts, trusses and purlins are eliminated and the architect estimates that spans could be almost doubled where called for by the design.

Design adaptability. The plywood folded plate system provides large, clear floor areas and freedom in arranging—or rearranging—interior partitions. The folded plate creates an unusually attractive profile, with bays defining individual store areas.

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Fir plywood folded plate components were built on ground, crane-lifted into position in pairs. Heaviest lift was about 1,000 lbs. Contractor was impressed with the ease with which his crew assembled and erected sections.

The folded plate provides distinctive profile, freedom in placement of interior partitions. The front was given a 10' overhang to cover store entrances. Underside was covered with medium density overlaid plywood to provide smooth, chock-free paint base.



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payload capacity and 18 big Bottom-Dumps. This fleet rolls up a combined total of 20,000 miles a day—some round trip hauls are 23 miles in length.

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months ahead of schedule

Loaded by 8 yd. shovels, the Bottom-Dump fleet hauls 30 yd. loads to drive-over hoppers at the start of a two mile conveyor system that loads the big barges.



Finished causeway will project 17 feet above the lake surface—"Eucs" top out the fill after barges have raised it above water.

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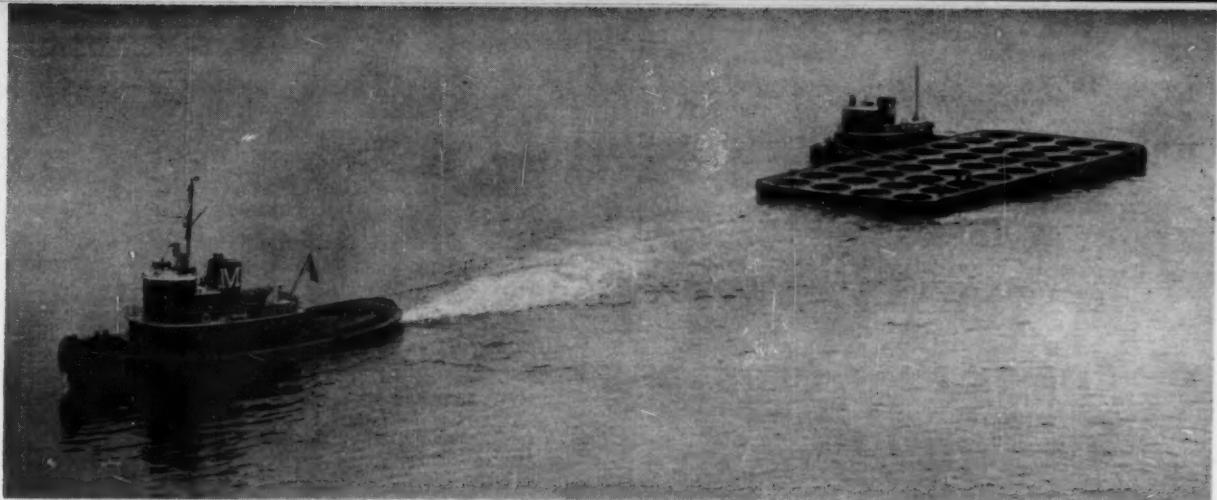
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TOWER PIERS—Tugs tow steel cutting edge of caisson from fabricator's yard to site. Contractor will sink the 75x162-ft steel-sheathed box in deep channel of river.

Two Ways to Sink Big Bridge Caissons

Costs dictate choice of sinking methods for caissons on Throgs Neck Bridge. One contractor sinks open boxes for tower piers, others pick sand island method for anchorage caissons.



ANCHORAGES—Concrete caissons for the anchorages are brought up lift by lift within a cellular cofferdam. A sand blanket forms a level platform for the box.

FOUNDATION work on the \$90-million Throgs Neck Bridge in New York City is a text book on the art of caisson sinking. Sub-structure contractors are sinking caissons for tower piers and abutments in two different ways.

Steel-sheathed open-box caissons for the tower piers are being sunk in the conventional manner. The contractor positions the pre-fabricated cutting edge of the caisson within a corral made up of four fender towers, and pours concrete into the hollow skin of the box to sink it down through the water to final position.

The two contractors on the bigger abutment caissons each elected to use the sand island method. They put a sand blanket down on the river bottom in the relatively shallow water near the river bank and installed a sheet-pile cofferdam to enclose the caisson. After dewatering the cofferdam with a wellpoint system, they sank the caisson in the dry by building up the concrete, lift by lift, with one set of forms.

Cost dictated the choice of method in each case. Size of the huge abutment caissons prohibited forming them with a permanent steel-plate skin. The expense of putting in the sand blanket and cofferdam was more than balanced by the saving in concreting the box with a single set of forms. For the tower piers, the depth of water near the center of the channel ruled out the sand island method.

The suspension bridge will span 2,910 ft between anchorages. Center span from center to center of tower piers will be 1,800 ft. The bridge will be another link across the East River between the Bronx and Queens.

continued on next page

TWO WAYS TO SINK BIG BRIDGE CAISONS . . . continued

Tower Pier Caissons Go Down in Deep Water

Merritt-Chapman & Scott Corp. of New York holds a \$7.5-million contract for the two tower piers. Each of the huge open caissons for the piers measures 75x 162 ft. A 13-ft-deep double-walled section at the bottom forms the cutting edge. Inside the caisson are 36 digging wells, arranged in four rows. Diameter of the wells is 14 ft.

Founding depth of the tower caissons varies because of the difference in elevation of the river bottom on the opposite sides of the channel. Depth of water on the Bronx side is 60 ft; on the Queens side, 80 ft. But both caissons have a founding depth of 75 ft below river bottom. The Bronx caisson reached final elevation of 135 ft below mean water level by the middle of November. The Queens caisson is now about 75% of the way down. It will go 20 ft farther than the Bronx caisson.

J. K. Welding Co. fabricated the cutting edges of the caissons at their Yonkers, N. Y., yard, launched them into the Hudson River, and towed them to the bridge site. They also supplied the sections of steel plate that form the sides of the caissons, the cylindrical inserts that form the digging wells, and the steel for the interior bracing.

First step for the MC&S construction crew when the cutting edge of the Bronx caisson arrived at the site was positioning it within a fender enclosure. Each fender consists of three rows of pipe laced together at the top by heavy tubular steel cross-bracing. There are four pipes spaced on 13-ft centers in each of the three rows. The pipes in the two inner rows are vertical, those in the outer row are battered on a 1 to 5 slope.

Size of pipe in the fenders varies for the two caissons. The 102-ft sections of pipe in the fenders for the Queens side are

20-in. dia. The shorter 75-ft pipes for the Bronx fender towers are 18-in. dia.

Two derrick barges carried each fender from the contractor's fabrication yard on shore to the site. A third barge-mounted derrick assisted in the placing of each fender. It held the bottom of the pipes until the top of the fender was in position, then let it swing down to the river bottom.

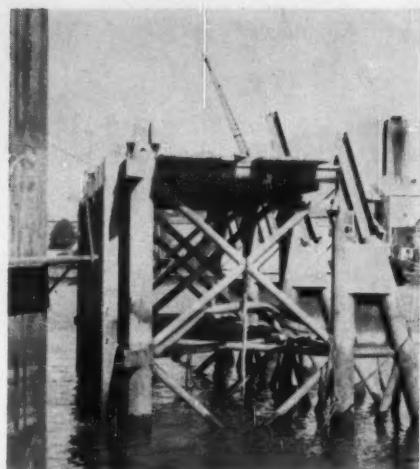
Then a piledriving rig drove 14-in. H-piles through the pipe sleeves to anchor the fender. Pile penetration into the river bottom was 75 ft, matching the founding depth of each caisson.

MC&S placed three of the fenders at what were to be midspans of the caisson sides and floated the caissons into place. Setting a fourth fender closed off the open side, pinning the caisson inside the corral. This closing fender consisted of only two rows of pipes and piles. Finally steel cable wound around caisson and fenders wrapped the box securely in place, minimizing the possibility of shifting during sinking.

The cutting edge of the Bronx caisson arrived at the site several months before the Queens caisson. It came without any steel erected for the upper levels above the cutting edge. When the Queens caisson arrived, there were some sections of side plating and some digging well sections already in place. But in both cases, the MC&S erection crew had to complete the first two lifts of steel before concreting operations began.

Three types of units had to be added to form the upper section of the boxes: skin plates, digging wells, and trussed cross-bracing. The first lift of steel was 20 ft high; the second, 34 ft. Height of subsequent lifts erected during the actual sinking of the caissons varied from 16 ft to 24 ft.

High-strength bolts connect the



FENDERS ENCLOSE CAISSON — Piles driven in pipe sleeves anchor fender towers.

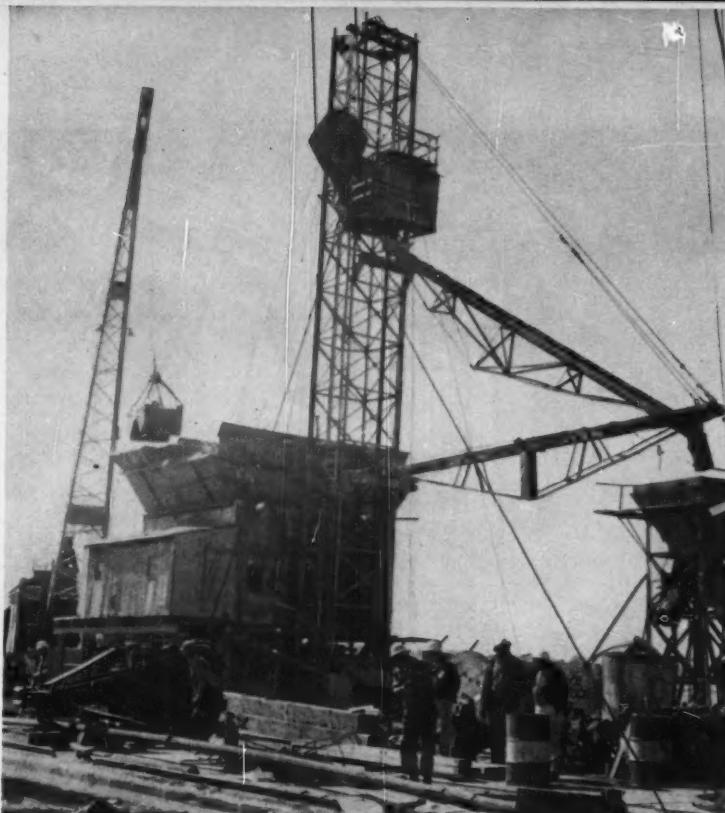
flanged joint between each lift of the cylindrical digging well sections. All other connections in the steel casing, whether shop or field, are welded. Thirty 300-amp Miller welding machines mounted on a barge service the operation.

The contractor prefabricates the cross-bracing for the interior of the caisson in 10-ft-deep box truss sections in a yard at the site. Four of the 17-ft box trusses reach across the width of the box. The digging well sections fit into the open squares in the center of the trusses. Short knee braces and struts are added to complete the bracing system.

The beams that make up the truss sections are light enough to be handled by a four to five man gang without help from heavy lifting equipment. Total strength of the fabrication and erection crew, including the 30 welders, reached a high of 100 men at one time. The crew could put up a typical 20-ft lift (weighing about 300 tons) in around 10 days.

The vital operation in sinking the caissons is the concreting. Setting up a concrete plant to produce 78,000 yd of concrete calls for careful planning.

The plant is mounted on a barge that shuttles back and forth from one caisson to the other. A



CONCRETE MOVES FAST—Barge-mounted concrete plant puts out a 2-yd batch a minute. Skip hoist carries concrete from mixers to 9-yd hopper that feeds the derricks.

4-bin batch plant feeds two 2-yd Ransome mixers. The Johnson automatic scales are supplemented by manual controls provided in case of emergency. A Wiley derrick mounted on the same barge charges the sand and aggregate bins with a 2-yd clam. Aggregate is shipped to the site from nearby commercial suppliers on barges. Two company-owned cement barges equipped with Fuller-Kenyon pumps take on cement at a railroad siding on the New Jersey waterfront and carry it to the site.

Path of the concrete from mixer to caisson is complex, but the concrete moves fast. The mixers dump into a 2-yd skip that carries the concrete to the top of a 70-ft-high tower and transfers it there to another 2-yd bucket. The tower bucket dumps the concrete into an enclosed chute that feeds a 9-yd wet-batch hopper mounted on a barge tied up between the caisson and the concrete plant.

Two 50-ton American Revolver derricks with 4-yd air-operated buckets deliver the concrete from the wet-batch hopper to 40 tremies on top of the caisson. The tremies are 40 ft long, and they can be extended when necessary with 3-ft detachable sections. The tremie pipes are 18 in. dia.

The derricks are mounted on two barges, one on either side of the barge that holds the wet-batch hopper. With their 125-ft booms, the derricks can just reach the other side of the caisson. When the steel skin-plates project high above the water, the booms clear the top of the caisson by only a whisker.

MC&S originally figured they'd have to put one of the derricks on the other side and feed concrete to it with a transfer hopper. But the way it worked out, the derricks can cover the entire area of the box from the one side.

The derrick operators have to be on their toes. The barges, clustered around the caisson like a brood of chicks around a hen, rock violently when passing ships kick up waves in the river. As the derricks teeter, the concrete buckets swing wildly over the heads of the crew. The operators wait a minute or two until the chop calms before lowering the buckets and resuming the pour.

The concrete plant can turn out a 2-yd batch per minute, or better. Rated capacity of the plant is 120 per hr, but output has run as high as 143 yd at times. The average production is about 115 yd per hr. Biggest single pour so far has been 1,400 yd in a 12-hr

day. An average day's pour of about 1,000 yd will bring up the concrete about 4 ft. Ordinarily, pours are continued on three or four consecutive days to make up a complete lift. There are no keys cast into the concrete; the surface is left rough to create a natural bond between lifts.

Total volume of concrete required to sink the Bronx caisson to river bottom, 60 ft below the surface of the water, was about 8,000 yd.

Progress through the silty river bottom varies considerably from lift to lift. The caissons do not move immediately when concrete is poured into the box. It takes at least several hours for the increase in weight to break the skin friction holding the caisson. Sometimes the concrete lift will barely budge the caisson, and the contractor goes into the digging phase of the cycle, hoping to reduce resistance and start movement.

The derricks handle the digging with 2½-yd clamshells. The two 50-ton Revolvers permanently stationed at each caisson alternate between digging, concreting, and steel erection.

The contractor started the first digging cycle when the caisson extended 30 ft into the river bottom material. Excavated material was loaded into 1,000-yd capacity scows to be towed away to a dumping area in Long Island Sound. After the first digging cycle, the clams cleaned out the bottom of the wells after just about every concrete lift to encourage movement of the caisson.

Regulating the depth of water in the wells changes the buoyancy of the caisson and aids in sinking. In order to increase the pressure of the caisson on the river bottom, the contractor lets water flow into the wells at high tide through a gate-controlled valve. No pumps are needed; the 9-ft change in river level between high and low tide takes care of the job. Digging wells are connected by a series of equalizer pipes to keep water level uniform in all wells.

The digging and concreting control the positioning of the caisson. The weight can be increased at one end to shift the caisson in that direction; and the clams can dig out more material on the side the contractor wants to sink faster.

This is where the real art of caisson sinking comes in. Allow-

TWO WAYS TO SINK BIG BRIDGE CAISONS ... continued

able tolerance is only 1 ft in either direction. It takes plenty of experience—and more than a little intuitive "feel"—to figure how the big box will move and keep it that close to plan location.

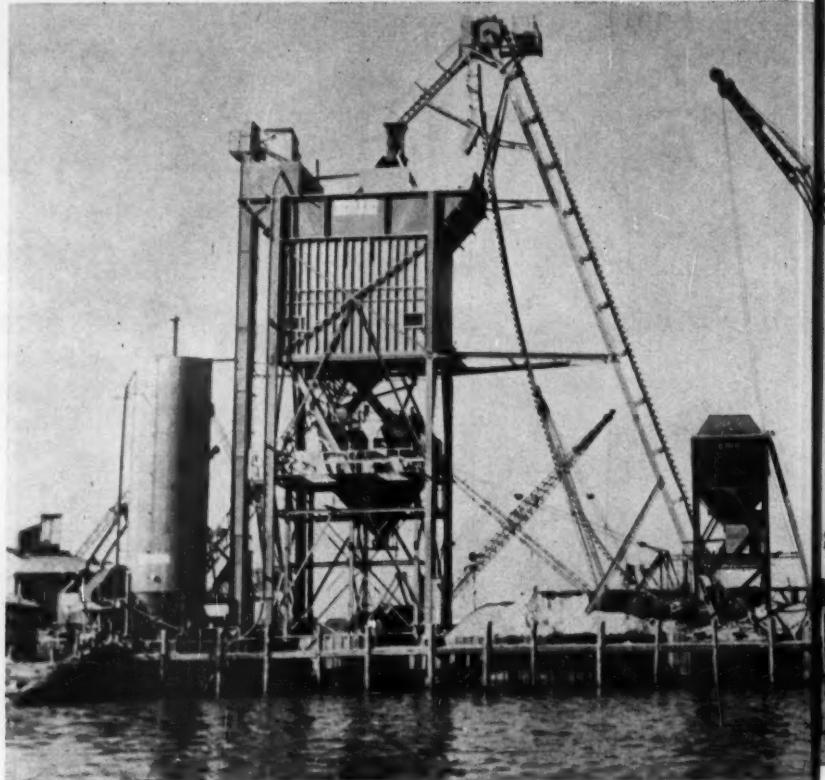
MC&S have an experienced crew on hand on this job to supervise the sinking operation. Most of the key men worked on the caissons for the Mackinac Straits Bridge. After that one, the Throgs Neck job figured to be duck soup for them.

But they ran into more trouble than they expected. On the Bronx caisson, the box hit a patch of boulders on the north side. To get through the obstruction without blasting it, the MC&S crew deliberately tilted the caisson slightly in the opposite direction, away from the rock to get a better cutting angle. When the box had punched through the bad spot, they brought it back to vertical by loading up concrete and digging deeper on the south side. Gradually, this compensating tactic straightened the box up and shifted it back to correct plan location.

After the caissons reach founding depth, clams clean out the bottom to just below the cutting edge. Then the contractor pours a tremie seal about 15 ft thick to close off the bottom of the caisson. The tremie seal extends 1 ft into the bottom of the digging wells. It calls for about 2,000 yd of concrete.

Next the contractor will fill the wells with water right up to the brim. Precast concrete lids will cover the top of the wells. A 4-ft distribution slab will then be placed on top of the caisson to encase the lids and form a base for the tower pedestals. Thickness of the slab may be increased up to 1 ft if the caisson should settle deeper than expected. On the other hand, if the caisson should end up slightly higher than plan elevation, the pedestal tower can be shortened.

Soldier beams set into the concrete of the distribution slab will hold steel plates extending above the top of the caisson to serve as fenders for the pier. Short horizontal struts cast into the concrete of the pedestal will brace the soldiers along their 30-ft length. The fender will stick up out of the water about 8 ft.



CONCRETE PLANT—An Erie-Strayer packaged plant with two 3-yd Worthington mixers produces up to 150 yd of concrete per hour for the Queens anchorage caisson. A crane

Cellular Cofferdams Enclose H

Both anchorage caissons are being sunk by the sand island method. Main difference from the procedure followed by MC&S in sinking the tower pier caissons is that concreting takes place within a cellular cofferdam enclosing the anchorage instead of out in the middle of the river channel.

This means that the contractor can form the concrete caissons in the dry with one set of forms, bringing up the concrete lift by lift much as mass concrete is placed for a dam. The sand island method is a very attractive approach to the problem of sinking a large caisson in relatively shallow water.

The contractor on the Bronx anchorage caisson, Fehlhaber Corp. of New York, had only to place a horse-shoe shaped cofferdam to cut off the anchorage from the river because of its proximity to shore.

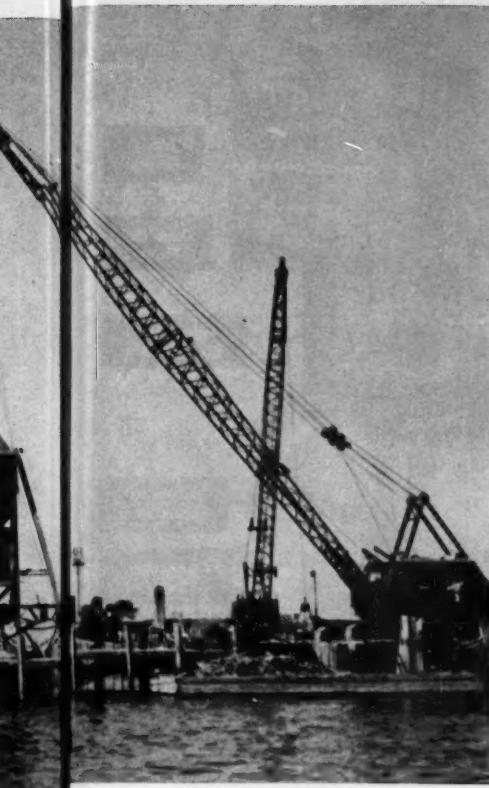
The contractor on the Queens side, a joint venture of J. Rich Steers, Inc., and Frederick Snare Corp., both of New York, had a

tougher job. They had to enclose the Queens anchorage completely with a cellular cofferdam measuring 170x260 ft. But both contractors went through roughly the same step-by-step procedure.

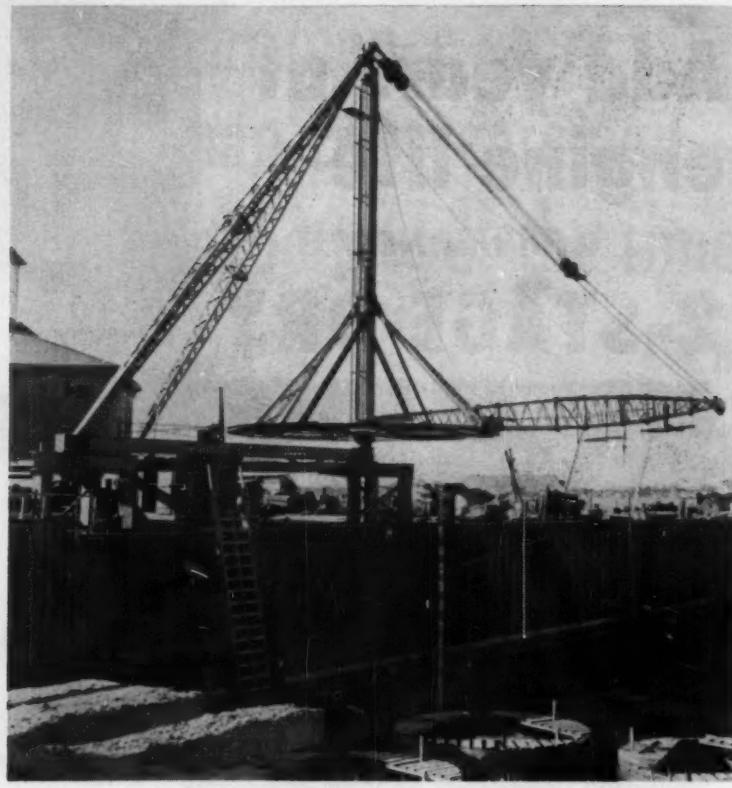
On the Queens side, the Steers-Snare combine first dredged more than 14,000 yd of mud and silt from the river bottom in the anchorage area. Then they placed a sand blanket varying in depth from 10 ft on the shore side to about 50 ft on the channel side. Depth of water in the area ran from about 30 ft to 70 ft. So the sand blanket formed a level platform on the river bottom. Top of the blanket was initially 30 ft below water level.

As the pile-driving rigs drove the sheet-pile cells of the cofferdam, bottom-dump barges placed additional fill within the enclosure to bring the final elevation of the blanket up to 20 ft below water. Altogether, the barges placed almost 150,000 yd of sand in the blanket.

The contractor next dewatered



with clamshell charges the 100-yd loading hopper that supplies aggregate to the bins.



DERRICK—A Clyde stiffleg derrick mounted on top of the cofferdam wall places concrete in the caisson. Its 150-ft boom can cover almost the entire area of the 146x226-ft box.

use Huge Anchorage Caissons

the enclosure in three stages. First three pumps lowered the water level 8 ft. Then a Griffin wellpoint system, with a 10-in. header at elevation minus 5 ft, dewatered to 17 ft below water level. Final stage, down to minus 25 ft, was accomplished with a 12-in.-dia header put in at elevation minus 15 ft.

A 7-ft-deep prefabricated steel cutting edge for the caisson arrived at the job in sections and was placed on the sand blanket after the exposed surface had been leveled by a tractor shovel.

The contractor filled the cutting edge with sand to support the forms for the first lift of concrete. They use Blaw-Knox cantilever forms for the sides, and cylindrical steel inserts for 77 digging wells inside the 146x226-ft caisson. Each well is 16 ft in dia.

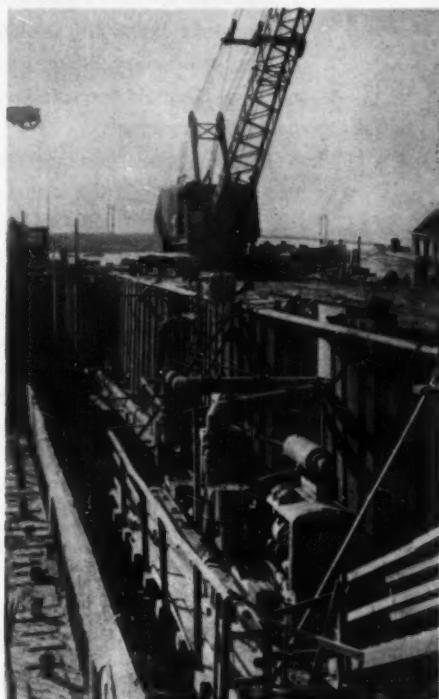
They bring the concrete up in 5-ft lifts, pouring the entire area of the box in three days. A Clyde stiffleg derrick with a 150-ft boom mounted on top of the cofferdam places most of the concrete.

After every five lifts, four Manitowoc 3900 cranes with clam shells excavate material from the digging wells. The cranes walk on top of the sand-filled cofferdam cells to reach all the wells.

Like MC&S, Steers-Snare also concentrated much of their planning efforts on assuring efficient concrete production. The plant they selected is a package unit manufactured by Erie-Strayer. It consists of two 3-yd Worthington mixers fed by a four-bin batch plant. Operation of the batch plant is fully automatic. Capacity is 150 yd per hour, but average output runs around 120 yd.

A crane charges the 100-yd loading hopper from the barges that bring aggregate to the site.

Heading up the job for the Steers-Snare combine is project manager Earl Larson. He is assisted by project engineer Frank McGahan. Top man for MC&S is project manager Jack Denny. Norm Albrecht is superintendent, and Don Mulhall is in charge of the office.

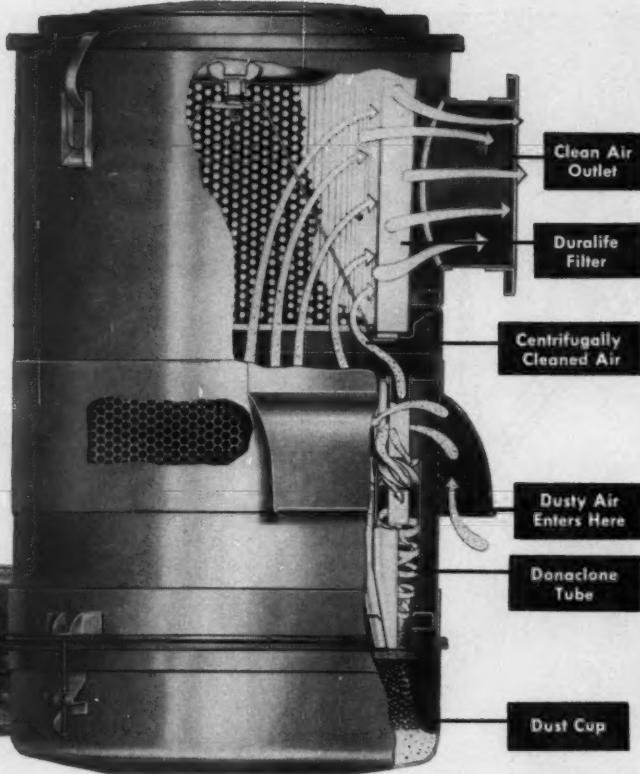


WELLPOINTS—Two headers—one 10 in., the other 12 in.—dewater cofferdam to minus 25 ft in two stages.

Add years of engine life

with this **NEW**

2-STAGE DRY AIR CLEANER



Install Donaclones on your equipment and you practically eliminate engine wear due to intake dust!

Donaclones set new high standards for dust removal . . . prolong engine life far beyond what is now considered satisfactory. Many leading manufacturers are making Donaclones standard equipment on their heavy duty machinery.

The Donaclone combines the dust removal efficiency of paper filtration with *long service life* by using

a new design centrifugal cleaner for the primary stage, which removes 98% of the dust before air reaches the paper filter.

Donaclones use no oil . . . eliminate the messy job of servicing oil bath types. Savings in oil and time alone repay you the cost of Donaclones in one year . . . the extra years of engine life cost you nothing. Many leading contractors are replacing with Donaclones as fast as possible. One company will have them on 700 machines by next season.



Up to 120 of these are used per cleaner depending on engine air requirements. Each tube is a centrifugal air cleaner.

Chemically treated to resist oil and water. Closely controlled porosity stops even extremely fine particles. Enclosed in steel shell.



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Branch factories at: Grinnell, Iowa; Oelwein, Iowa; Chillicothe, Missouri

This great performance story began more than two years ago—and it's getting better all the time!

More than 50 Allis-Chalmers HD-21's are handling Toquepala's toughest jobs for Utah Construction Co. and Morrison-Knudsen Co., Inc.



Working up to 14,000 feet high in the Peruvian Andes, to develop a large mining project for the Southern Peru Copper Corporation, these tractors have been constructing roads . . . building railroads . . . preparing sites for entire new towns.

They've faced some of the toughest conditions in the world . . . rock, sand, dust, cold and high altitude all rolled into one. After two years of round-the-clock operation, these machines have piled up an outstanding performance and on-the-job record.

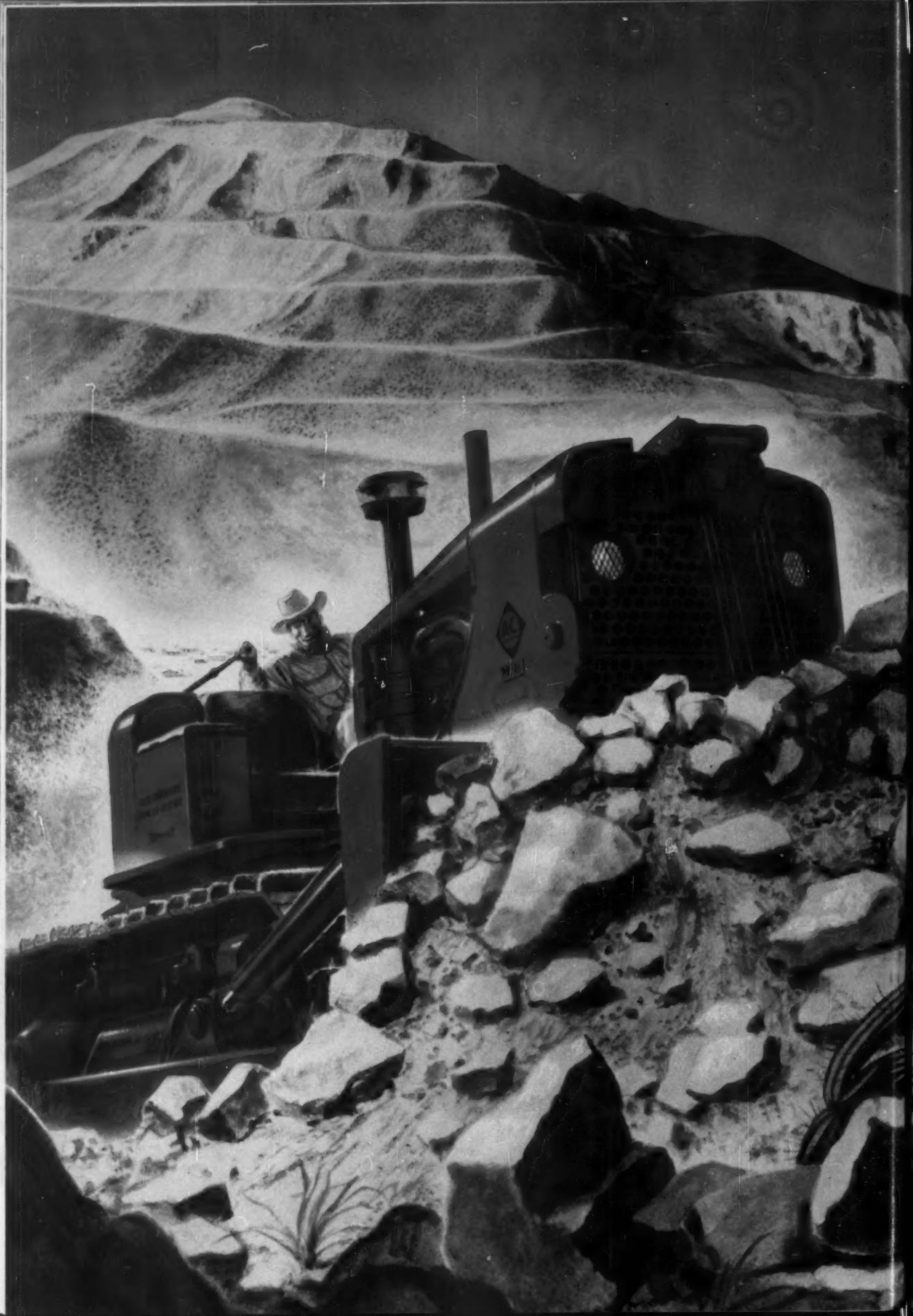
The Toquepala story is another good reason why you should have all the facts on the new HD-21. Across America, as in the Andes, leading construction men are discovering that the HD-21 is the long-life, big-production crawler tractor they've been looking for. See your Allis-Chalmers construction machinery dealer. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

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...power for a growing world

CRAWLER TRACTORS • MOTOR GRADERS • MOTOR SCRAPERS • TRACTOR SHOVELS
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Working on New Frontiers high in the Peruvian Andes

Mining specialists . . . men of construction . . . and a great fleet of giant Allis-Chalmers crawler tractors are changing a remote, mountain-top desert into a modern mining center.

Toquepala (*pronounced Toe-kay-pah-la*) is its name—a wilderness hidden deep in the ancient land of the Inca Indians, so bleak and devoid of rain it's truly a mountain-top desert. There, 11,500 feet above sea level, one of the biggest mining projects in history is now under way.

Among the first machines moved ashore at the start of this venture were big Allis-Chalmers tractor-bulldozers, and today they're part of the team that is breaking through the barriers to Toquepala. To span the 100 miles from the mine to the nearest seaport, these giant tractors are pushing aside sand and rock to help build a network of roads and a railroad . . . and they're biting into mountainous terrain to level a site for a new town of 10,000 people.

Thus, the might of modern construction machinery is helping to unlock the treasures of Toquepala, considered inaccessible just a few years ago. And when the ore is ready for processing, 14 huge Allis-Chalmers mills will start grinding up this 400-million-ton mountain of copper ore at the rate of 30,000 tons a day . . . free the valuable mineral from the waste and prepare it for concentration, smelting and refining. Then, Toquepala will be one of the world's great copper mining centers, and long-range needs for this vital metal will be supplemented by a new source of supply.

From trail blazing to processing, this mammoth project typifies Allis-Chalmers service to the mining industry—through an unusually wide range of construction, power and processing equipment. It also typifies Engineering in Action . . . bringing better living to more people wherever it goes. **ALLIS-CHALMERS, GENERAL OFFICES, MILWAUKEE 1, WIS.**

Toquepala is a project of the Southern Peru Copper Corporation, which is stripping more than 120 million tons of overburden to reach the actual ore deposit at the mine. Major construction work for the roads, railroad and town site is being handled by two famous American contractors, Utah Construction Company and Morrison-Knudsen Company, Inc.

**move ahead with
ALLIS-CHALMERS
... power for a growing world**

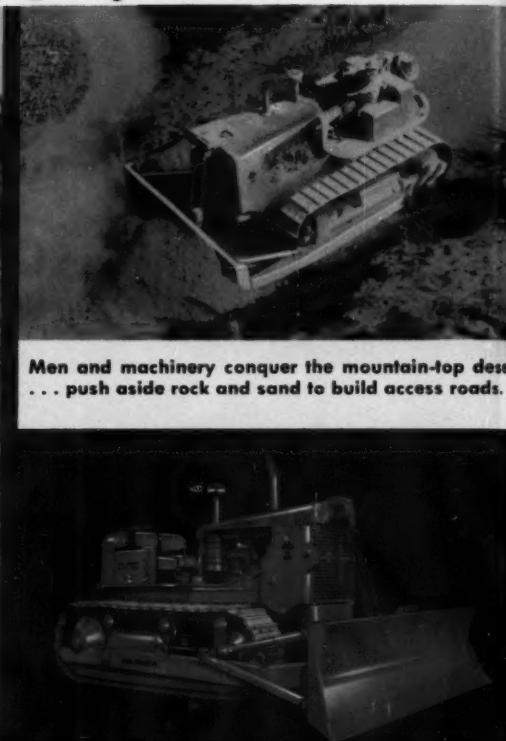


At sea level... or 14,000 feet up

Allis-Chalmers HD-21's are the tractors for your tough jobs



Big Allis-Chalmers tractor-dozers cut the rocky, mountain country to size to develop a town site.



Men and machinery conquer the mountain-top des... push aside rock and sand to build access roads.

HD-21 — 225 net engine hp; torque converter drive; 56,260 lb (approx. as shown)

You, too, can have the outstanding performance Utah Construction Company and Morrison-Knudsen Company, Inc. are getting from the more than 50 Allis-Chalmers HD-21's at Toquepala. Call your Allis-Chalmers dealer now. He will demonstrate the HD-21 on your job at your convenience.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

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...power for a growing world





20,000 psi

New SJI 20,000 psi design standards offer added useful strength *in steel joist construction*

Architects and engineers now are offered SJI Standards for open web steel joists based upon 20,000 psi working stress. Open web steel joists meeting the Institute's recommended specifications are thus in balance with all other steel used in structures. Greater economy and a more efficient use of steel result.

Another recent development by the SJI has been an increase in the number of recommended Series "S" joists from 17 to 25, to provide greater flexibility and a more exact

application of open web steel joists for given structural loads.

The Institute has also published new combined specifications and load tables covering both "L" and "S" Series joists.

These new developments by the Steel Joist Institute give added assurance that you can specify with confidence when using steel joists produced in accordance with the standards and specifications of the Steel Joist Institute.

Send coupon for free copy of combined specifications and load tables.



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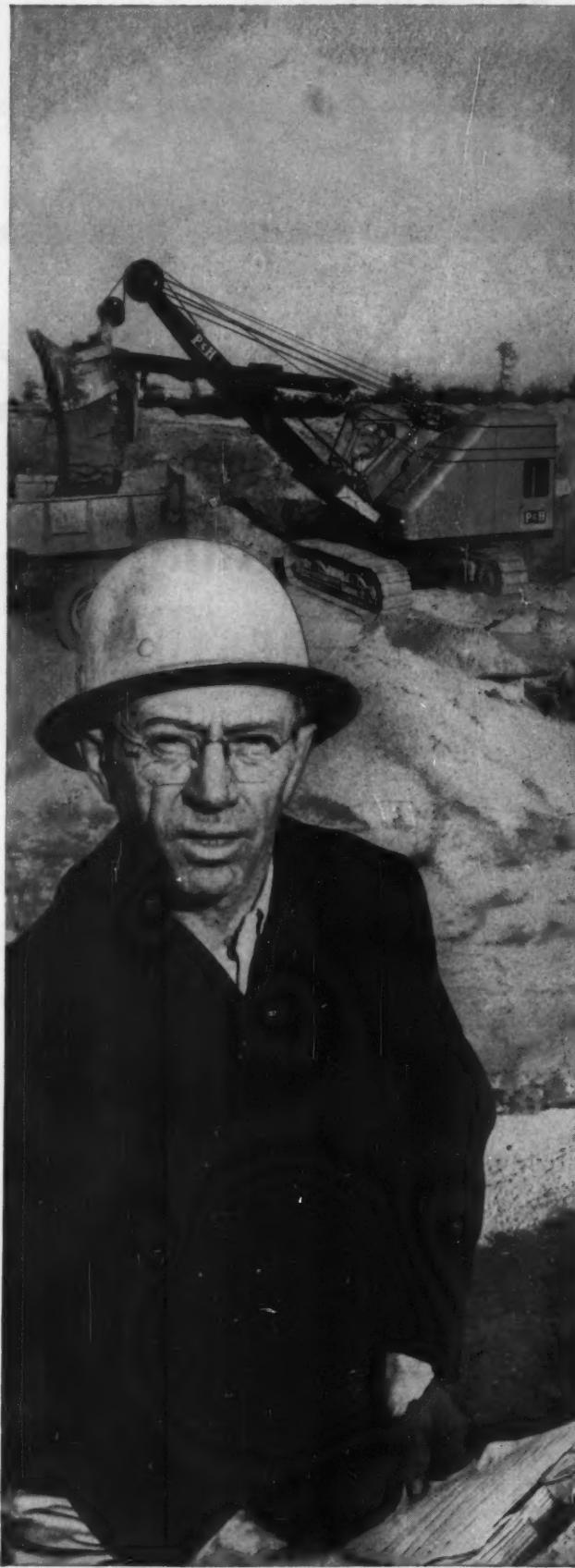
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Standard Specifications and Load Tables.

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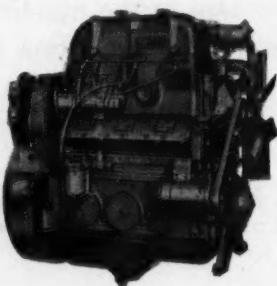
**"Power to really
dig in and
do a day's work"**

Mr. Wulf, general manager of Monmouth Trucking Company Sand and Gravel Pit, is enthusiastic about his P&H Diesel powered $\frac{3}{4}$ -yard P&H 255A shovel. You hear reports like his everywhere about the P&H Diesel. It consistently makes good equipment perform better and results in less downtime for maintenance.

Until Harnischfeger developed the P&H Diesel, owners had to be satisfied with diesels which did not fully utilize all the potential of their equipment. But now, P&H Diesels have changed this situation with:

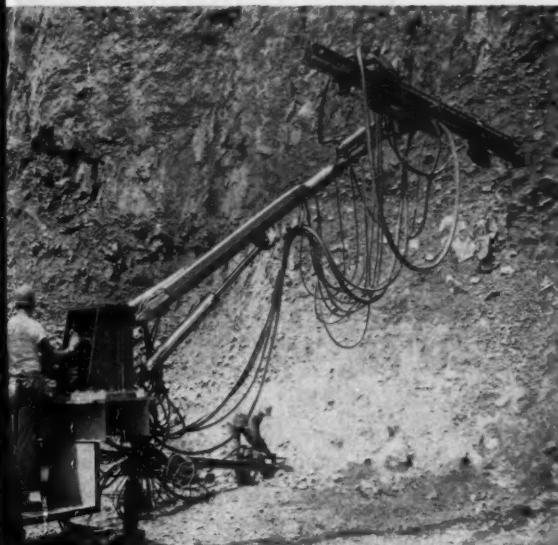
- better response, faster starts, better idling than any other make of diesel
- delivers more power with less fuel—uses low-cost No. 2 diesel fuel
- 25% fewer working parts and all wearing parts are interchangeable
- compact design results in easier maintenance—smaller parts stock

For all of your equipment—including crushers, front end loaders and other portable equipment—specify the one diesel with all the features that deliver top performance—P&H Diesel. P&H Diesel Engine Division, Crystal Lake, Illinois.



P&H DIESELS
Fastest Growing Name In Diesel Power

GYRO-FLO in the news



High holes, horizontal or at any angle, are no problem at all with this truck-mounted drilling rig. Operator at the control station can "spot" the drill anywhere he wants at the touch of a throttle.

Photo below shows that toe holes are "duck soup" for this Gyro-Flo 900 and Hydra-Boom combination.



Truck-Mounted Drilling Rig Helps Contract Driller Meet Deadline Dates

"Take a highway truck chassis, add a 900-cfm Gyro-Flo compressor and two I-R Hydra-Boom units equipped with two D45, 4½" Bore drifter drills, and you're in business with the fastest contract-drilling unit you ever saw." So says an official of the New Jersey Drilling Co., who admits that this is a slight oversimplification. "Some planning and good design went into this rig, too. The I-R distributor and sales engineer sure did a fine job on this rig."

The truck-mounted drilling rig shown here has lived up to his every expectation—helped him finish up faster and meet the tightest deadlines with a minimum of man-hours and drilling expense.

GYRO-FLO 900 PROVIDES AMPLE AIR POWER

A standard 900-cfm Gyro-Flo rotary portable compressor, less running gear, was mounted on a 6-wheel highway truck chassis. There was plenty of room available to mount two Hydra-Boom drills. The completely self-contained compressor provides ample air power for any job—will run both heavy-duty drills simultaneously at full pressure. The rig can move from job to job at a moment's notice and at maximum highway speeds. A frame above the compressor holds the drill towers while in transit.

HYDRA-BOOMS CONVERT SETUP TIME TO DRILLING TIME

With two heavy-duty I-R D45 rock drills mounted on Hydra-Booms, the New Jersey Drilling Co. can set up to drill any type of hole patterns in a matter of minutes. All drill-tower motions, including power dump and swing and power cone, are controlled by the touch of a throttle. Husky hydraulic cylinders, five for each drill, have completely replaced the time-consuming muscle power formerly required to set up for each hole.

Ask your Ingersoll-Rand representative to show you how Gyro-Flo compressors and I-R rock drills can help speed your drilling work, with important savings in cost per foot of hole.

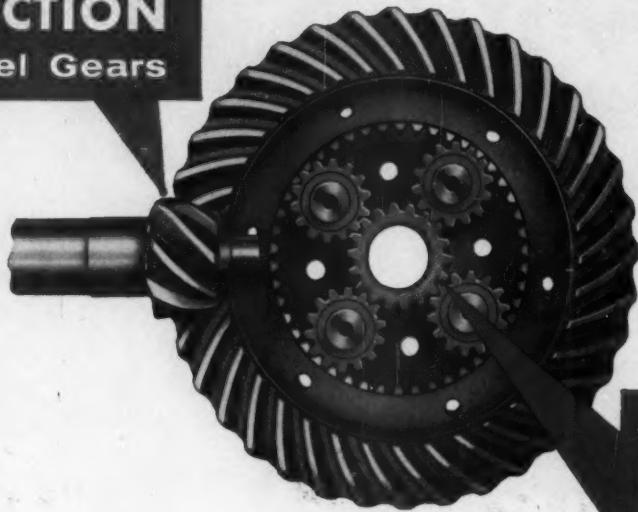


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AN UNBEATABLE COMBINATION . . . GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

A New Concept in Double Reduction Truck Axles

**FIRST
REDUCTION**
in Bevel Gears



**SECOND
REDUCTION**
in Planetary

Eaton Planetary Double Reduction *Gives You these Important Benefits!*

Save Weight

—Size for size, Eaton PDR Axles weigh less than conventional herringbone or spur gear axles, permit truckers to haul more legal payload.

Last Longer

—In Eaton PDR Axles, gear tooth loads are equally distributed over four rugged "planet" gears; stress and wear are reduced, resulting in materially longer axle life. Eaton's forced-flow lubricating system provides positive lubrication to all moving parts, even at slowest vehicle speeds—a feature not available in other double reduction axles.

Cost Less to Maintain

—When and if repairs are necessary, parts are readily available—most of them interchangeable with other Eaton Axles. Simple construction—similar to the famous Eaton 2-Speed Axle, with which all truck service men are familiar—holds maintenance labor to a minimum.

Previously, double-reduction axles have been available only in the extra heavy-duty sizes. Eaton PDR Axles are available in a wide range of sizes—the last word in equipment to meet the demands of today's hauling conditions. By actual comparison they cost less to buy, less to maintain. They have established outstanding performance records in all types of heavy-duty operation.

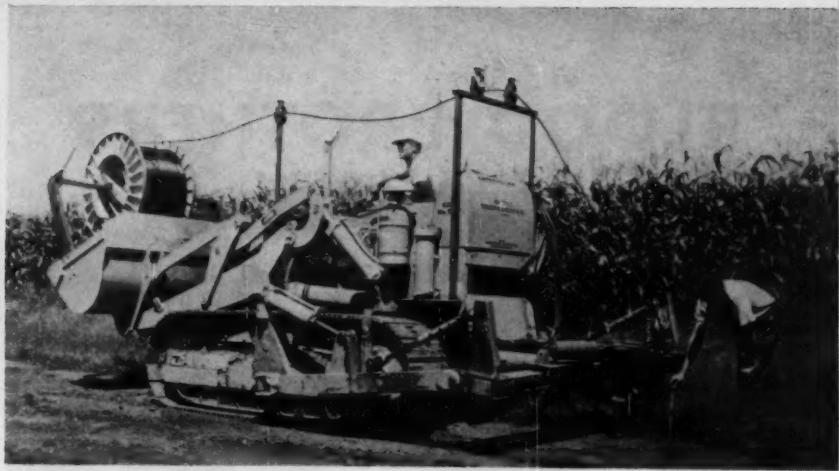


Ask your Truck Dealer for
Complete Information about
Eaton PDR Axles

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AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO

A standard Caterpillar Traxcavator converted into a cable-laying machine can place 10 miles of cable to a maximum depth of 40 in. in a single day.



LAYS CABLE QUICK—A Cat Traxcavator, carrying the spool in its bucket, makes a high-speed cable-laying rig. Special steel tooth mounted on tool bar works from either side.

One Rig Digs Trench, Lays Cable

HAWKEYE Construction Co. of Davenport, Iowa, laid 139 mi of telephone cable in northern Illinois in 45 days—and they did the job with only one machine.

The machine is a Caterpillar No. 977 Traxcavator with special cable-laying attachments built to Hawkeye's specifications by Altorfer Machinery Co., Cat distributor at Davenport. It offers these advantages:

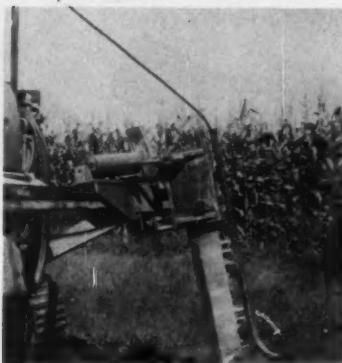
- It lays cable to a precise depth and close to the road pavement.

- It stalls immediately if the trenching tooth strikes rock or other obstacles (if the tractor did not stall, the tooth would pull up; that would disturb hundreds of feet of the cable previously placed.)

- The tooth is specially designed so that it opens a trench just wide enough for the cable. It can work on either side of the tractor.

The Altorfer rig was thoroughly tested by local telephone companies, but Hawkeye gave it its biggest test. On the northern Illinois project cable was placed 24 in. deep. The contractor operated the Traxcavator in third gear. According to Altorfer, the integrally mounted cable-laying tool has the capacity to lay 10 mi of 2½-in. cable a day to a depth of 40 in.

Altorfer came up with the Hawkeye rig, called the Trench-All, after a series of trials and errors. The distributor first tried to adapt a special tooth to a standard rear-mounted ripper. This did not work out because the tooth could not be shifted



WORKING END—Cable is carried through a two-part boot on the back of the blade of the Altorfer Trench-All. Hydraulic cylinder slides tooth across rear of tractor.

easily across the tractor's rear.

Next, Altorfer used the Caterpillar tool bar—a hydraulically controlled draft frame that mounts on the roller frames and extends across the rear of the tractor. This worked out fine and offered an extra advantage; independently controlled hydraulic rams on each side keep the draft frame level even when the tractor works on slopes.

The specially designed steel tooth, just wide enough to open a small trench for the 2½-in. telephone cable, is fitted with a replaceable wear shim. In early trials the tooth was hinged to permit the tractor to turn easily. It did not work out this way, however, because the operator had trouble turning his machine when the tooth was moved away from the center of the draft bar.

Instead, Altorfer mounted the

tooth rigidly and added a hydraulic ram to control the angle between the tractor and the tooth. With this arrangement, the tractor can be turned without touching a steering clutch.

At first, cable was placed in the trench through a tube pinned to the back of the tooth. Once again, this design had to be revised. When an obstruction was encountered and the tooth had to be pulled out of the ground, the cable was cut to get the tube off. The answer to this problem was a two-part boot. Now, when it is necessary to pull the tooth out, one half of the boot slips off easily and the other part is freed by pulling a pin.

Hawkeye must lay its cable as close as possible to the pavement, but they have been warned against damaging the paved surface with crawlers. So that the tooth can be positioned at the extreme end of either side of the tractor, Altorfer installed a hydraulic ram that slides the tooth across the draft frame. The cylinder is pinned to the draft arm, and the piston is attached to the mounting bracket. With this help, the tooth can move from a position behind one track to a point about 2 in. past the center line of the tractor.

The Traxcavator carries the cable spool mounted on a frame in the loader bucket. Cable feeds over the top of the tractor through two fairleads—one mounted on a post on the hood and the other carried on a bar across the fuel tank. The rear bar has two sheaves so that cable can be strung from either side.

BLOOD BROTHERS

Universal Joints

OFFERED BY ROCKWELL-STANDARD IN SIZES
FOR ALMOST ANY PRODUCT APPLICATION

SIZES AND TYPES FOR HEAVY-DUTY
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SAVE ENGINEERING TIME!

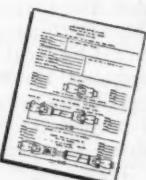
Here at Rockwell-Standard, you can select from a wide, wide range of Blood Brothers Universal Joints and complete drive assemblies. Torque capacities range from 350 to 500,000 inch-lbs.—lengths from very close-coupled industrial joints to assemblies 120 inches overall.

You can be confident they are produced in a modern, centrally located plant, tooled for precision manufacturing. And you can rely on their high reputation for dependability.

When you need universal joints and drive lines, you can save valuable engineering time too—by stating your problem to our engineers. They're cooperative, friendly and experienced. *Just write or call.*

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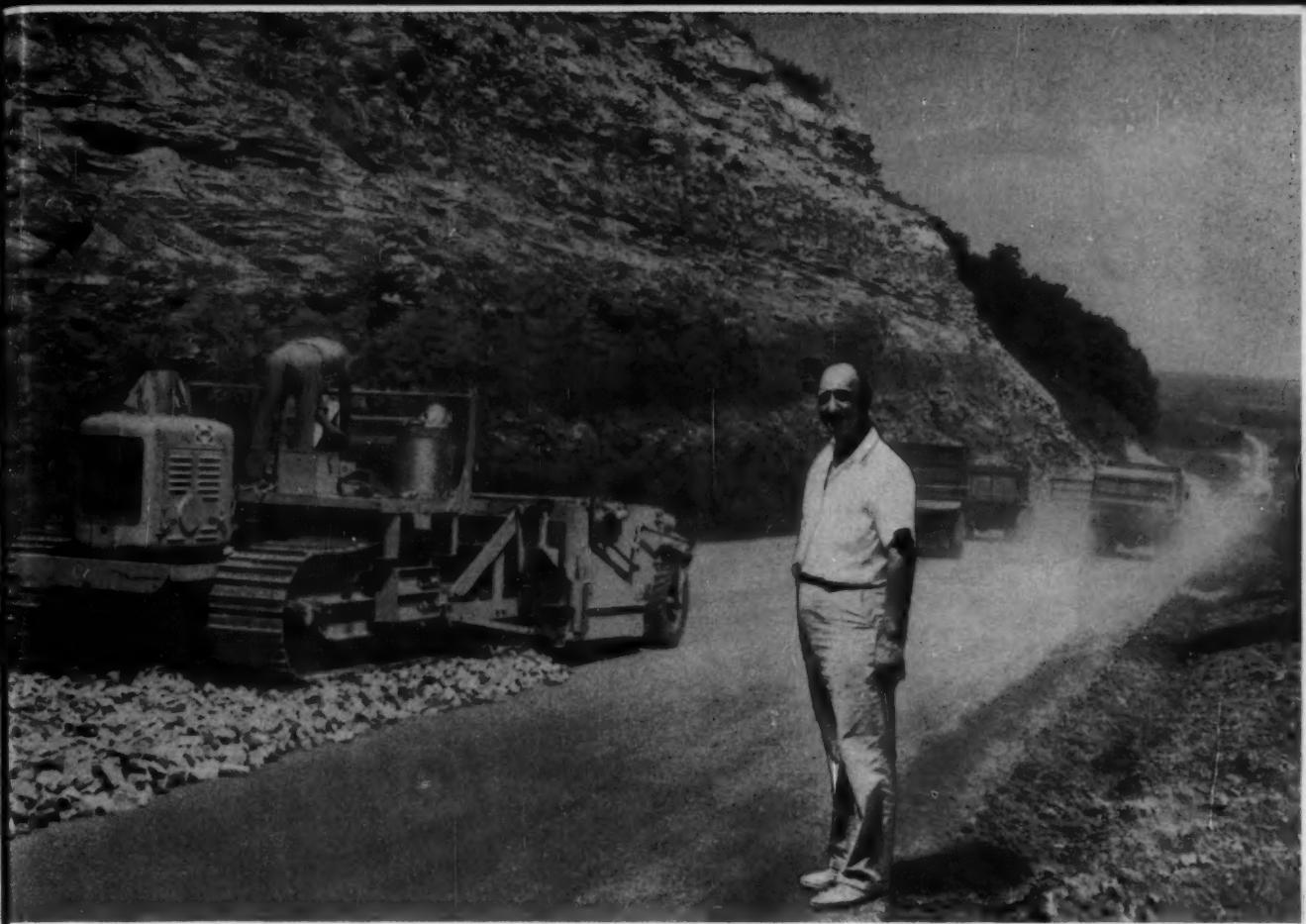


Blood Brothers Universal Joints

ALLEGAN, MICHIGAN

UNIVERSAL JOINTS
AND DRIVE LINE
ASSEMBLIES

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Dick Ellis watches Blaw-Knox Base Paver lay down six inch stone on a nine mile stretch of U. S. Route 27 between Stanford and Somerset, Kentucky.

"It's hard to believe there could be so much difference"

"We've been laying 3,000 tons of six inch material a day. The best we ever laid before in an eight hour day was 2,000 tons of No. 1 stone (4"-1½"). That was with two spreaders, too," reports Dick Ellis, superintendent for Corum and Edwards of Madisonville, Kentucky.

"This Blaw-Knox Base Paver handles a seven ton load in sixty seconds. Every 500 feet the base paver back-tracks and shifts for another pass. That gives us three passes at the 36-foot wide road bed. At intersections we take just ten min-

utes to adjust the box to 16 feet, and in a few more minutes the approaches are knocked out, putting the rig back on the main road," he adds.

Corum and Edwards, like contractors all over America are reaping the benefits of modern, high capacity machines like the Blaw-Knox Base Paver with its specifically engineered tractor and oscillating screed, to meet the demands of today's job—at a profit. Your Blaw-Knox distributor will be glad to give you full details on the Blaw-Knox Base Paver. Why not call him soon?



BLAW-KNOX COMPANY

Construction Equipment
300 Sixth Avenue

New York 10, N. Y.



Gasoline, Diesel, or LP Gas—New Multi-Range 6-cylinder engines for the International 460 Utility—gasoline, Diesel, LP Gas—deliver 61 hp at the flywheel, 48 at the drawbar.

New International® 460 Utility tractor

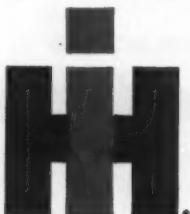
...SMOOTH 6-CYLINDER POWER

with brawn to match!

Add new Multi-Range 6-cylinder power to International's traditional built-in brawn . . . you literally step into a *new world of utility tractor performance!*

Here's sensationaly SMOOTH power, virtually vibration-free, to lessen operator fatigue and thus step up daily output. It's economical power, because new Multi-Range design delivers remarkable fuel economy at every load range. It's flexible power, with instant governor response to load demand at any engine speed from 900 to 1,800 rpm. And it's power, balanced with built-in brawn, that delivers over 48 drawbar horsepower for the widest range of heavy-duty utility tractor work.

Ask your IH dealer to demonstrate the new 460 Utility . . . or others in the complete International line, 12.8 to 72.5 bare engine hp. For free catalog, or name of your nearest IH dealer, write International Harvester Company, Dept. CME-1, P. O. Box 7333, Chicago 80, Illinois.



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HARVESTER Dealer**

International Harvester Company products pay for themselves in use—Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois



Built-in brawn means tractor strength and stamina to handle big buckets on heavy-duty International Pippin or International Wagner backhoes—sizes for trenching to grade 10, 12½, or 13¼ feet deep.



New Fast Reverser Unit speeds up shuttle-type operations. In each of five gears, the reverse speed is 22 per cent faster than the forward speed in that gear.

Industry Moves Ahead with Plan '59 . . .

To modernize now for growth and profits

The most expensive task to be performed in America, in this new year of 1959, is the modernization of our industrial plant and equipment. This is true despite the huge expenditures on new facilities made in the past decade.

Contrary to popular opinion, and even to much learned opinion, our industrial facilities are not up to date. In a special survey conducted in August 1958, and supplemented by further interviews since that time, the McGraw-Hill Department of Economics found that it would take \$95 billion to bring all our plant and equipment up to the best modern standards. This is over \$15 billion more than the record budget of the U.S. government for the coming year.

How did we get so far behind? It is true that business has made record capital expenditures in recent years, but most of this investment has been to expand capacity. And in concentrating on new capacity, industry has fallen behind on the modernization of older facilities. Meanwhile, the \$8 billion a year surge of research and development has brought forth new machines and new processes, at a rate that

makes prewar and even early postwar equipment badly obsolete.

The lag between what research has promised—especially in more efficient tools of production—and what has actually been accomplished up to now shows clearly in the **AMERICAN MACHINIST** inventory of metalworking equipment for 1958. This new study, covering 167 types of equipment in 5,800 metalworking plants, shows that three out of five metalworking machines are over ten years old. This is a startling indication of how obsolete many plants have become. A 1958 machine tool is 54% more productive than one purchased in 1948. Many of the tools industry now uses are actually of 1939, or earlier, design.

Investment Starts Up

Now industry's plans for 1959 show a new awareness of the need to modernize. In its surveys, conducted during the last part of 1958, the McGraw-Hill Department of Economics discovered these facts:

(1) Companies generally believe that a larger investment in modernization will

mean more profits—soon. Most of the manufacturing companies in the surveys expect their current modernization expenditures to pay off in less than five years. With labor costs rising steadily, it is only with better, more modern equipment that most companies can hope to make these profit gains.

(2) Industry's plans for modernization have been revised upward. Total plans for 1959 investment, in new plant and equipment, now come to \$33 billion—compared with \$31 billion reported earlier. And most of these new plans are directed toward modernization—installing new processes or making ready for new products, developed out of the most recent scientific advances.

It therefore seems clear that modernization expenditures in 1959 will rise enough to make an impressive start on the job of updating our plant and equipment. But it will be no more than a start. Research also is moving ahead with giant strides. Plant expenditures must increase rapidly, from 1958's low level, to win the battle against obsolescence.

How Can We Modernize Faster?

What can we do to accelerate industry's new drive for more modern plant and equipment? One aid will be an improved flow of technical information on how, and where, to modernize. With this purpose, the McGraw-Hill Publishing Company several months ago inaugurated PLAN '59, a joint effort by all its magazines to spotlight the best opportunities for modernization. During 1959, McGraw-Hill publications will continue this effort by putting special emphasis on new developments in plant and equipment.

On the key problem of financing modernization—the question "Where's the money coming from?"—the McGraw-Hill Department of Economics plans several new studies in the months ahead. The first of these will deal with the number one problem in financing: the need for adequate depreciation allowances. Such studies

are a small, but we hope a helpful, part of the total effort that is needed to modernize American industry.

An Individual Effort

The really vital steps in modernizing must be taken by individual companies. The backlog of obsolete plant and equipment is widely dispersed, among firms of all sizes and in all areas. It cannot be wiped out by dynamic equipment policies on the part of a few leading firms. Not just a few, but thousands of industrial companies must take inventory of their respective equipment and compare it, case by case, with the best new machines available.

Finally, there is need for increased public recognition of the modernization problem, and for federal tax policies appropriate to a period of rapid technical change in business.

The most important point is that the modernization drive has begun. This start can accelerate, with intelligent business and public policies, to give us truly modern industrial facilities. Plant and equipment expenditures are finally beginning to reflect the stepped-up pace of research and development. This can be a major factor in renewed economic growth and prosperity as we move into 1959.

This message was prepared by the McGraw-Hill Department of Economics as part of our company-wide effort to report on opportunities for modernization in industry. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or part of the text.


Donald C. McElroy
PRESIDENT

McGRAW-HILL PUBLISHING COMPANY, INC.

Wanted: Rough, Tough Jobs!



Vesuvius "X" Gear Compounds help handle the toughest loads under the roughest conditions on gears, wire rope and cables.

Vesuvius "X" Gear Compounds are specially processed leaded compounds widely known as the "friend of every road contractor." They are designed for use on medium and slow speed, large size, exposed and enclosed industrial gears, wire ropes and cables.

Vesuvius "X" Gear Compounds are made to take care of the toughest loads under the rough-

est conditions of heat and water. They are heat resistant. And they are uniquely compounded so that they are also highly water resistant. Even in cold weather they don't crack or peel off.

Although Vesuvius "X" Gear Compounds are highly water resistant and tenacious, they are best applied to clean dry surfaces.

Vesuvius "X" Gear Compounds vary in consistency from complete fluidity in the lighter grades to heavy solids that must be heated for application in the heavier grades.

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*When you want top performance
you want Amoco Lubricants*

American Oil Company, 555 Fifth Avenue, New York 17, N. Y.

AMOCO ALSO PRESENTS...

Amoco HDX Oil

Amoco Superior Diesel Oils, S-1, S-2, S-3

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Permalube All-Purpose Grease No. 158

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Aeroquip Hose Lines Speed Field Maintenance, Cut Replacement Costs

ON ALL TYPES OF CONSTRUCTION EQUIPMENT



Join the many equipment operators who standardize on Aeroquip Hose Lines with Reusable Fittings for all fluid lines. With Aeroquip, you make quick replacements in the field or in the shop. Just cut the length of hose you need and attach the fittings with hand tools. A small inventory of bulk hose and some spare fittings meet all hose line requirements. Get all the money-saving and time-savings facts from the Aeroquip Distributor listed in your Yellow Page Phone Book, or write us.

AEROQUIP 1508



For very high pressure hydraulic lines or extremely severe applications, use Aeroquip 1508 Hose with multiple spiral wrap wire reinforcement.

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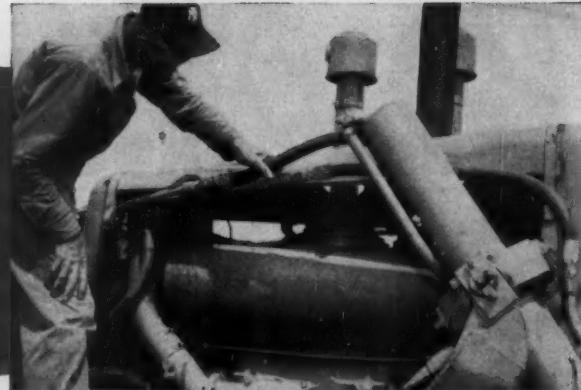


For high pressure hydraulic lines, use Aeroquip 1509 Double Wire Braid Hose and Reusable Fittings.

AEROQUIP 1503



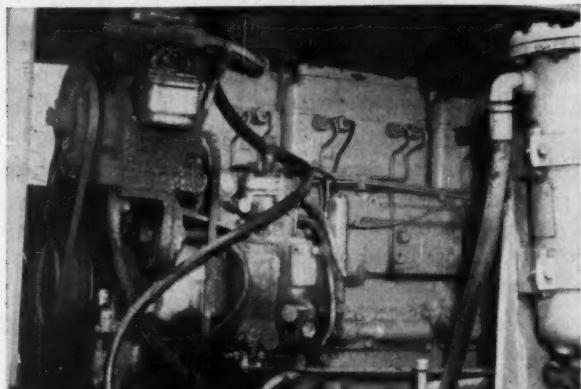
For engine lube oil, air and water lines, use 1503 Single Wire Braid Hose and Reusable Fittings.



Aeroquip 1509 High Pressure Hydraulic Lines on this dozer are extra tough, extra durable. They withstand heat, cold, vibration, abrasion, constant flexing.



This replacement Aeroquip Hose Line is being installed on a Caterpillar D9 Tractor. Replacement lines of any length can be made up in the shop or field using Aeroquip Hose and Fittings.



Engine fuel, lube oil, water and air lines can be assembled quickly as they are needed with Aeroquip Hose and Fittings. They withstand vibration, give long service.



REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

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LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD



Contractor for Glen Canyon Bridge: Kiewit-Judson Pacific-Murphy Corp. in a joint venture.

Bold New Bridge Spans the Mighty Colorado. At Glen Canyon, near the Arizona-Utah frontier, a great steel bridge will soon carry north-south traffic over the Colorado. The bridge is a brilliant feat of engineering. Anchored in sheer canyon walls far above the river, it is the country's highest and second-longest steel arch span.

Lower chords are tied into skewbacks on opposite sides of the canyon. As steelwork progressed from two directions toward the closure point, Bethlehem 1½-in. bridge strand was used to hold the arches in position. These strong wire cables were run to the upper chord members from big tieback towers, which themselves were securely guyed by Bethlehem strand. This system of tiebacks and guys proved an effective means of supporting the steel segments as they thrust out into space.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING





Louis R. Perini, President, Perini Corporation. Mr. Perini has headed up the organization since the death of his father in 1924. Mr. Perini has been a subscriber to CONSTRUCTION METHODS AND EQUIPMENT magazine since 1929.

The Perini Corporation of Framingham, Massachusetts, has gained worldwide recognition for its vast contributions to construction and the growth and progress of nations.

Perini Corporation is a family organization which began in 1885 when B. Perini, an immigrant from Italy, began to work on water supply and highway projects in New York and Massachusetts. By 1917 he had established a construction Co., B. Perini & Sons Inc. Today, Perini Corporation is one of the largest construction companies in the world and performs every kind of heavy construction.

Perini Corporation emphasizes diversification

Besides the parent company, in a ten-year period, the drive and zeal of the Perini brothers, Lou, Charles and Joseph, coupled with top management personnel developed these additional companies: Perini Limited, Toronto; Perini Quebec, Inc., Montreal; Majestic Contractors Ltd.; Bay State Dredging & Contracting (Perini's Marine Division) Ceril-Perini Assoc., Inc.; Perini-Westward Developers Inc., W. Palm Beach, Florida, Perini Pacific and Milwaukee Braves. The emphasis is on diversification, as Mr. Lou Perini says, "to keep from getting too many heads under one hat."

\$500 million of construction completed in 5 years

In the period 1954-1958, the Perini Corporation produced a staggering record of \$500 million of completed construction . . . an average of \$100 million per year for five years. In 1958 Perini recorded \$90 million of construction both domestic and foreign. To get the work done, in addition to a permanent staff of 750 people, the Perini Corporation employs around 8,500 workers.

In the early years practically all of Perini's work was on

How the Perini Corporation helps America with \$100 million

...using over 3,700 pieces of machinery

...\$50 million of materials

...over 8,500 workers

highways, sewers, and dams in New England. Today, Perini tackles projects ranging from tunnels, dams and pipelines, to highways, bridges, marine buildings, airports, etc. The diversification of contracting operations in the construction industry today is reflected in the scope of Perini's operations which now extend from Vermont, N. Hampshire, Massachusetts, New York, Pennsylvania, to Indiana, Wisconsin, California, Canada, Iran and Australia.

The building division of the corporation has built almost every kind of structure since 1946. The latest venture of the Perini Corporation is the \$350 million West Palm Beach Westward Expansion project in Florida.

Marine Division — Since its beginning in 1911, the Marine Division of Perini Corp. has engaged in all types of marine work, including the building of bridges, breakwaters, sea walls, submarine pipe lines, cable-laying, piers and also the demolition and disposal of various marine structures.

\$50,000,000 invested in materials in 1957

In the construction of dams, bridges, highways, buildings, pipelines, etc., the Perini Corporation expenditure for cement, lumber, steel, explosives, pipe, glass, insulating materials, etc. is great. In all, \$50 million of materials of all kinds was purchased in a year by Perini. This reflects the vast purchasing power of this contractor and the significance of contracting operations on the economy of the nation.

Owns and operates over 3,750 units of equipment

A construction contractor like Perini, whose work extends from coast to coast and three separate continents requires a wide variety of construction equipment in adequate numbers. Because of the many different kinds of construction for which Perini contracts, more than \$15 million has been invested in over 3,750 pieces of equipment of all types. Below is a list of this equipment which reflects the many kinds of work which Perini is equipped to do.

PERINI EQUIPMENT INVENTORY

111 compressors—(Joy, Ingersoll-Rand, Worthington, Chicago-Pneumatic, Gardner-Denver, Schramm, LeRoi, Brunner, Westinghouse, Kellogg)	677 trucks — trailer-hauling units — (Caterpillar, International, GMC, Euclid, Mack end dumps) 205 pickup trucks (misc. manufacturers)	11 locomotives	10 vibrating screens
23 graders—Caterpillar, Allis-Chalmers	246 welding machines	300 electric motors $1\frac{1}{2}$ to 150 hp	9 aggregate bins and batchers
21 front-end loaders—(Eimco, Michigan, Hough, Caterpillar, Allis-Chalmers)	3 bituminous spreaders and finishers—(Barber Greene)	4 pavers—(Ransome, Koehring)	(Blaw-Knox, Erie, Butler, Hertz)
32 pumps	15 cement silo storage	13 pile hammers & extractors — (McKiernan & Terry, Vulcan, Syntron)	8 air receivers
35 rollers — (Buffalo-Springfield, McCay, Bros, Ferguson)	65 concrete buckets	7 pumpcrete machines—(Rex)	1 bituminous concrete mixing plant — (Hetherington & Berner)
32 scrapers—(LeTourneau, Caterpillar, Euclid, LaPlante Choate)	7 concrete finishing screeds—(Master tournatrowel, Blaw-Knox)	7 rakes—(Fleco)	4 boats, water tankers
114 shovels, cranes, draglines, backhoes—(Manitowoc, Marion, Northwest, Bucyrus-Erie, Lorain, Koehring, Austin Western, Insey, Link Belt, Lima, Cleveland Trencher, Byers)	16 concrete mixers	2 rooters — (LeTourneau - Westinghouse)	2 oil barges
156 crawler tractors—Caterpillar, Allis-Chalmers	3 concrete mixing plants—(Johnson, Koehring)	26 saws—(DeWalt, Skil, Arbor)	67 buckets, clamshell and dragline
10 rubber tired tractors	25 concrete vibrators	12 truck scales	42 boilers — heaters — steam generators
	3 conveyors	2 deck scows	3 cement guns
	7 crushing plants — (Telsmith, Cedar Rapids, Universal)	17 scows—dumper	5 cement unloading plants at road — (Blaw-Knox)
	658 drills	12 stone spreaders — (Nickerson, Buckeye Birch, Jersey)	3 lighter and pile driver
	4 dredges	4 sweepers—road brooms — (Homer Magnetic, Littleford, W. E. Grace)	3 transmit mixers—4½ yds. (Jaeger)
	1 derrick	10 trailers—field office	5 vibratory soil compactors—(Johnson, Vibro-tamper)
	69 fans—ventilating	1 trailer—house	4 airplanes — (DC-3, Cessna, Aer Commander, Otter)
	72 portable electric generators	322 transformers	1 loader—(Euclid 54" belt loader)
	49 hoists	9 tugs	40 2-way radios—(Motorola)
		60 tunnel muck cars	4 base stations—(Motorola)

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Perini helps to change the face of \$10 million of construction a year

Perini purchases \$7.5 million of equipment in 1957

The important role of construction machinery in Perini Corporation construction operations is obvious. And as construction contracts awarded Perini have increased, so too, has the corporation's equipment inventory. \$7.5 million of new machinery of every description was purchased for replacement and increased needs in the year 1957 alone. In 1958 over \$1½ million went into additional equipment.

Purchasing at Perini Corp. a vital operation

Because of the wide variety of equipment owned and operated by the Perini Corporation in all its foreign and domestic operations, Charles Perini, Vice President in charge of equipment administers this vast \$15 million inventory of machinery, its distribution, maintenance, etc. The purchase of this equipment is one of Perini's most important operations.

Hugh F. Doherty, Secretary, has this to say about the important buying influences and purchasing operation in Perini corporation:

"Before we invest in equipment, top management meets with our equipment superintendents, job superintendents and project managers to get their opinions (and those they supervise) regarding equipment needs and performance. Only by knowing if the men using equipment are satisfied with it, and that it does the job project managers want it to do can we make sound equipment buying decisions. Meetings and conferences help us to determine equipment requirements, to formulate recommendations and make the right buying decisions. It's not a one man job by any means."

Key personnel subscribe to CONSTRUCTION METHODS magazine

LOUIS R. PERINI, President of Perini Corporation, says: "I find CONSTRUCTION METHODS a most worthwhile publication for me personally in keeping abreast of what is going on in our industry, and even more important I have tried to make sure that our key personnel receive the magazine in their homes and read it thoroughly each month."

Mr. Perini has been a subscriber to CONSTRUCTION METHODS since 1929.

In addition to Joseph R. Perini, Treasurer, Charles Perini, Vice President, the other vice presidents and top management personnel, there are 70 key personnel in Perini Corporation with paid subscriptions to CONSTRUCTION METHODS.

The Perini Corporation exemplifies the major role of construction contractors who are changing the face of America. Contractors are by far the biggest buyers of construction machinery, materials, supplies and services . . . the lifeblood of the industry. Today, there are some 3,100 contractors like Perini who received over \$1 million in contracts in 1958 . . . and do over 80% of all heavy construction. In all, there are some 9,300 who received contracts of \$100,000 or more in 1958.

CONSTRUCTION METHODS offers advertisers an effective, low-cost way to reach and sell 46,920 key men in construction; 4,000 in over 13,000 contracting firms, both large and small. Advertise in CONSTRUCTION METHODS . . . the contractor magazine . . . and get your share of the \$52.3 billion construction market for 1959.

U.S. Dept. of Commerce

**Construction
Methods** AND
EQUIPMENT



McGRAW HILL PUBLICATION
WEST 42nd ST., NEW YORK 36, N.Y.

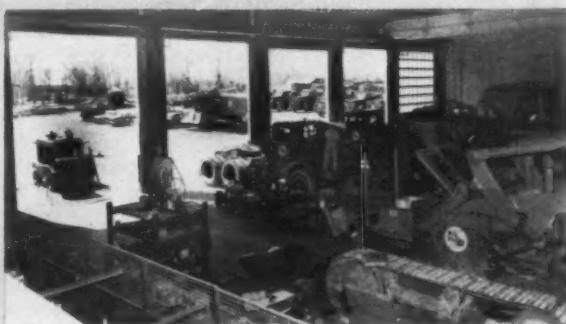


Charles B. Perini, Vice President. Mr. Perini is in Charge of equipment constantly visiting projects and supervising equipment distribution and use. Mr. Perini has been a subscriber to CONSTRUCTION METHODS for 25 years.

Shown above, excavation for Boston Herald-Traveler Building. \$3 million project. Building will have 210,000 sq ft of floor space. Rigs shown drilling caisson foundation and excavating.



\$55 million Perini managed joint venture. Equipment shown in heading operation of 51 ft diameter hydraulic tunnel for Hydroelectric Power Commission of Ontario. The longest "big tunnel" in the world.



One of Perini's 12 maintenance buildings. Some 750 men are employed in Perini's maintenance operation which requires \$2.5 million a year. An inventory of \$750,000 of maintenance parts is maintained at the main shop in Framingham, Mass.



Geared by **FULLER** . . .

...M-R-S 38 Cubic Yard Scraper Combination equipped with R-1550 ROADRANGER®

M-R-S Manufacturing Company, Flora, Mississippi, recently announced a new 38 cubic yard, struck—48 yard, heaped—capacity scraper combination.

The 600 hp M-R-S Model 250 Tractor provides ample power to pull the big scraper at speeds up to 34 miles per hour, with a substantial power reserve for maximum gradability. When necessary, traction to the drive wheels can be increased by use of the M-R-S hydraulic weight transfer feature.

To make most efficient use of the power and traction of the Model 250, M-R-S offers as standard equipment the Fuller R-1550 9-speed ROADRANGER® Transmission.

Designed for off-highway service with the largest high-speed diesel engines built, the semi-automatic R-1550 ROADRANGER features nine forward and two reverse ratios, all controlled with one gear shift lever. Short, even steps between gear ratios—averaging 38%—combined with pre-selected,

automatic range shifts, permit proper gearing for all conditions at all times. Air powered countershaft inertia brake allows quick upshifts without double clutching. For faster work cycles, lower fuel consumption, longer engine life, less operator fatigue, GREATER PROFITS . . . specify Fuller. Your equipment dealer or manufacturer can recommend the most efficient, easiest-shifting Fuller Transmission for your specific operating requirements.



FULLER

TRANSMISSION DIVISION
MANUFACTURING COMPANY
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Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
Automotive Products Company, Ltd., Brock House, Langham Street, London W.1, England, European Representative

Construction Men in the News...

ARBA Elects 1959 President

NELLO L. TEER, JR. is the 1959 president of the American Road Builders Association. He was elected at the ARBA's national convention held in Dallas, Tex.

President of the Nello L. Teer Co., Durham, N. C. contractors, Teer has been an outstanding figure in the highway industry for many years. He is a national director of the Associated General Contractors of America and past director of the AGC Carolinas Branch. He is a past president of the Carolina Road Builders Association and has been on the contractors' division of the ARBA. He also has served as vice president of the southern district of ARBA and as a director of the Associated Pennsylvania Constructors.



AASHO



RALPH H. BARTELSMAYER is the new president of the American Association of State Highway Officials, a job that makes him the spokesman for the highway departments of 49 states.

The new AASHO president had been chairman of the organization's transport committee, a group that is reviewing truck size and weight limitations.

Bartelsmeyer now is chief engineer of the Illinois State Highway Department. He has been with the department since his graduation from the University of Illinois as a civil engineer in 1931. During his term with the department he has been a junior highway engineer and county roads superintendent. He became chief engineer in 1953.

He is a member of the Illinois Association of County Superintendents, The Illinois Society of Professional Engineers, the Il-

linois Engineering Council, and the American Road Builders Association.

Morrison-Knudsen



N. D. (DAN) TETERS is a new vice president of the Morrison-Knudsen Co., Boise, Idaho.

Teters will manage M-K's special projects, primarily foreign operations. He is a veteran of 20 years in overseas construction and has been M-K resident partner in charge of United States airbase construction in French Morocco for the past eight years.

At the start of World War II he was in charge of construction on Wake Island and was among 1,100 civilians captured by the Japanese when Wake fell. He spent nearly four years in a prisoner of war camp and made two unsuccessful attempts to escape before he was freed at the end of the war.

H. K. Ferguson



RALPH W. OLMSTEAD is the new president of the H. K. Ferguson Co., Cleveland, Ohio. Ferguson is principal subsidiary of the Morrison-Knudsen Co., Boise, Idaho.

Olmstead has been an M-K and Ferguson executive for the past eight years. He was appointed a Ferguson vice president in 1954 and executive vice president in 1957. He is a specialist in municipal parking garages and helped direct construction of underground parking facilities in Los Angeles, Pittsburgh and Detroit.

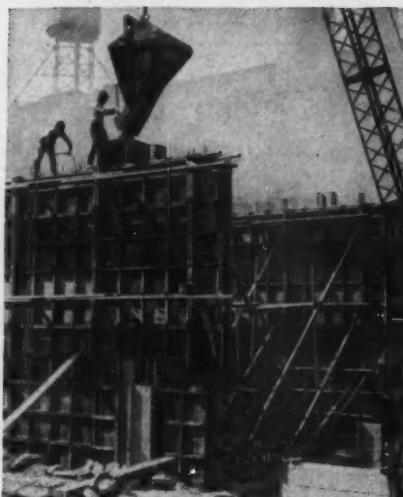
During the 30's, Olmstead served as secretary to Idaho Sen. James P. Pope and later as an assistant to Agriculture Secretaries Henry Wallace and Claude Wickard. During World War II he was an Army lieutenant colonel and later worked with the United Nations Relief and Rehabilitation Administration in China.

CUT CONCRETING COSTS WITH Richmond FORMING METHODS

You can save time and
money by making forms
with your lumber and

Richmond
Form-Tys and Accessories.

Setting, pouring and stripping forms goes faster when you use the Richmond Snap-Ty Form System. With this system you



can build your own prefabricated panels. Form erection is reduced to an assembly procedure of the reusable low cost panels into durable forms suitable for continuous pours.

RICHMOND SNAP-TYS

FOR TYING LIGHT CONCRETE FORMWORK



1/2" or 1" BREAK SNAP-TY ASSEMBLY—3000 LB. OR 5000 LB. SAFE LOAD

Richmond Snap-Tys are specifically designed for quick, easy and accurate erection of light foundation wall forms. With Richmond accessories they will give you a worthwhile saving from start to finish.

Spreader washers of ample size are precisely located to give the exact wall thickness. Head washers of special steel are securely held by a clean, well formed upset on each end of the tie to give positive bearing on the Tyholder, thus trans-

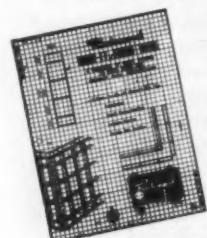
mitting the full strength of the Snap-Ty to the walers and preventing the possibility of costly breaks.

Break points are set back from the wall face to permit easy, clean stripping and prevent spalling of the concrete. The small tie holes and indentations on the washers, or cones if they are used, are easily pointed.

Richmond Snap-Tys are available with safe loads of 3,000 lbs. and 5,000 lbs.

Richmond does not make, sell or rent forms. Richmond sells Form-Tys and accessories and shows you how to make your own forms which can be used over and over. Profit by this fast, easy method for erecting light foundation walls. Send for your FREE copy of the Richmond Snap-Ty Form Book, containing complete diagrams and forming data. At the same time, ask for the current Richmond Handbook, which describes the full line of Richmond engineering tying devices and accessories.

Write to: Richmond Screw Anchor Company, Inc.
816-838 Liberty Ave., Brooklyn 8, N.Y.
or 315 South Fourth St., St. Joseph, Mo.



TOP FORM SPREADER CLEAT

CORNER WASHER

OUTSIDE CORNER CLIP

INSIDE CORNER STRAP

PANEL STRAP

FORM BRACE



Some of the new accessories developed by Richmond for easy on-the-job assembly of prefabricated modular form panels.

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Diamond T Motor Truck Co.: The following four distributors have been appointed: Pitchford's, Inc., of Eugene and Portland, Ore.; Osterlund, Inc. of Harrisburg, Pa.; Sal's Garage of Lindenhurst, N. Y.; Shetrom's Garage of Huntingdon, Pa.

Four Wheel Drive Auto Co.: The following eight distributors have been appointed: Allen Equipment Co. of Fort Dodge, Iowa; Capitol Trailer & Body Co. of Springfield, Ill.; Deseret Dodge Truck Center, Inc. of Salt Lake City, Utah; W. W. Hicks of Duncan, Okla.; Rapid Equipment Co. of Rapid City, S. D.; Harlan Shinkle Truck Sales of Peoria, Ill.; Bogue Tire Service of Guelph, Ont., Can.; and G W. Titus of Edmundston, N. B., Can.

The Yale & Towne Mfg. Co.: The following three distributors have been appointed: The Intermountain Equipment Co. of Pocatello, Idaho; The Capitol Tractor & Equipment, Inc. of Morton, Ill.; and The Contractors Equipment Co., Inc. of Lexington, Ky.

McKiernan-Terry Corp.: The Parker Equipment Co. of Salt Lake City has been appointed exclusive contract distributor for the State of Utah.

On the Sales Front

Food Machinery and Chemical Corp.: The Florida Division has appointed H. L. Clevenger as sales manager for Form-Crete products. He will make his headquarters in Lakeland, Fla., and his territory will include all states east of the Rocky Mountains.

Cummins Engine Co.: The following four appointments are announced: G. W. Paine, manager of the Canadian region with

NEW

AIR-COOLED DIESEL ENGINES now available through **HERCULES**



JLO-325



JLO-660

THE JLO* SERIES

(pronounced "ee-lo")

Distributed in the United States by Hercules Motors Corp.

*Reg. TM of Jlo-Werke, G.m.b.H., Pinneberg, Germany

Check these outstanding features:

- **SIMPLICITY:** Jlo Series diesel engines are of 2-cycle design: eliminate valves, tappets, push-rods and camshaft for dependable, maintenance-free operation in their horsepower range.
- **LIGHTWEIGHT:** 2-cycle simplicity and judicious use of aluminum in construction reduce the weight of Jlo Series diesel engines to less than 15 pounds per horsepower!

FOR MORE INFORMATION
send for illustrated booklet

- **ECONOMY:** Initial economy is coupled with maintenance economy since simplified Jlo Series design eliminates the problems of valve adjustments, and reduces cost of overhaul.
- **PERFORMANCE-PROVED:** Jlo Series air-cooled diesel engines have been used in every climate for every service in their power range. Fast-starting and rugged, they are ideal for both "stand-by" and continuous-duty operation.

HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

HERCULES ENGINES . . . Sold and Serviced the World Over

HERCULES MOTORS CORP.

Dept. 12A
CANTON 2, OHIO

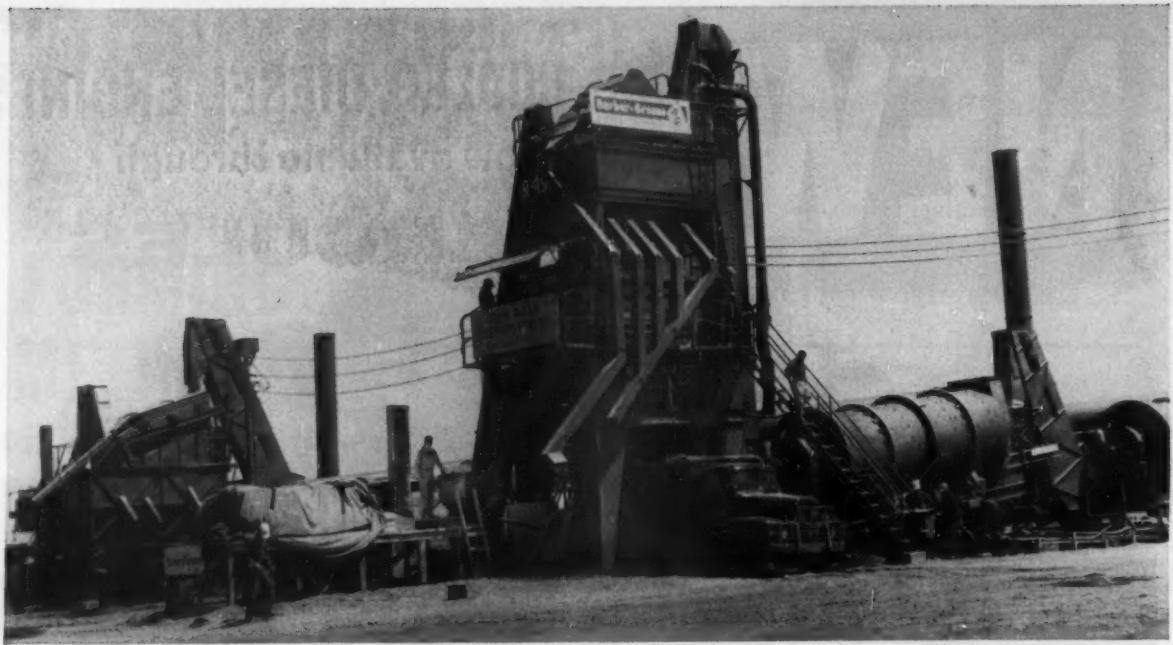
Please send me more information on JLO Series air-cooled diesels and the name of my Hercules distributor.

Name _____

Company _____

Address _____

City _____ State _____



At left is the Barber-Greene Continuous Plant; at right is the BatchOmatic. Together these plants produced all asphalt tonnage on the test road. Both proved their ability to meet abnormally rigid specifications.

Barber-Greene meet tight AASHO test road specs

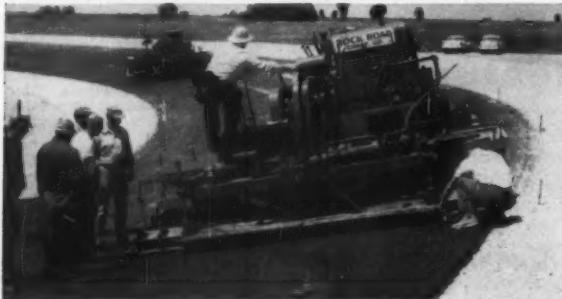
Two Barber-Greene Asphalt Plants, a continuous type and a BatchOmatic, produced every ton of asphalt mix on the AASHO test road near Ottawa, Ill. Every ton was laid with Barber-Greene Finishers.

Specifications on this important test road were more rigid than any normally encountered in highway work. Probably no asphalt mixing and paving equipment has ever before been called upon to meet such close tolerances.

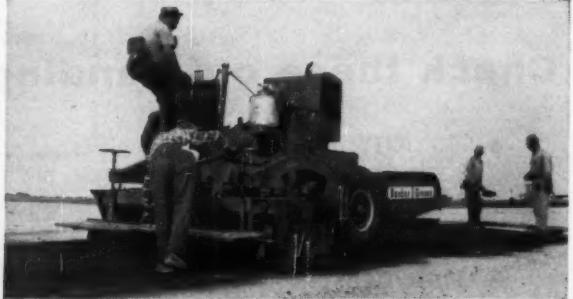
Hundreds of combinations of asphalt mixes and base

and surface thicknesses were required. Each operation had to fall within the time limits specified by a rigid time schedule.

"We knew that Barber-Greene Asphalt Plants and Finishers had the ability to meet these rigid specifications," commented the asphalt contractor, Rock Road Construction Company of Chicago. With over 20 years' experience in the operation of Barber-Greene Asphalt Paving Equipment, the results again justify their confidence in Barber-Greene.



Paving steep super-elevations while staying within close specification tolerances was just one of the stringent requirements successfully met by Barber-Greene Finishers on the test road.



Paving on crawlers and traveling on rubber, the new Barber-Greene Model 873 Finisher paved all the test road's 6' asphalt shoulders in four days—at 64 different locations.

58-48-AL

Write for information on the world's most modern asphalt paving equipment.

Barber-Greene



AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

SALES AND SERVICE...

continued

headquarters in Toronto; G. H. Weaver, representative, Canadian region with headquarters in Seattle, Wash.; J. J. Studenic, manager of the Southwest region with headquarters in Los Angeles; D. L. Campbell, representative in the Eastern regional office in New York City.

Harnischfeger Corp.: William Spelius has been named district manager of the Chicago office. He replaces George Artus, who is now a special representative for the Industrial Division.

The General Tire & Rubber Co.: The following four appointments are announced: John B. Gabriel, south central representative, special purpose tires; Thomas L. Heffner, south west manager, TBA sales; Richey I. Brunskill, manager of the Memphis Division; and Neil M. Andrew, manager, truck tire sales.

Iowa Mfg. Co.: Robert C. Johnson has been appointed district sales representative for the Cedarapids line of equipment in Arkansas, Louisiana, Oklahoma, and Texas. He will make his headquarters in Dallas, Tex.

International Harvester Co.: The following appointments are announced: Willard F. Hall, assistant sales manager of the Construction Equipment Division; C. E. Jones, manager of engine sales of the Construction Equipment Division; P. D. Evans assistant Eastern regional sales manager.

Thew Shovel Co.: A new Marketing Division has been formed for the company's Lorain line of power shovels and cranes and Moto-Loader line of front end loaders. D. L. Douglass, in the newly-created position of Director of Marketing, has been appointed to administer the new division. M. B. Garber is resigning as director of sales and this title will be discontinued. Mr. Garber, who remains as vice president and director plans to retire next year. Field sales will be handled by G. E. Gunther, sales manager for shovels and cranes, W. H. Madden, sales manager for loaders, and F. S. Battin, export sales manager.

continued on next page

It COSTS LESS To BUY THE BEST



...NEW H-90 PAYLOADER

When you buy equipment that must earn money, it pays to buy the best. That is why thousands of the famous Model HO "PAYLOADER" tractor-shovels were purchased and why this new, improved Model H-90 will prove even more popular.

Full 9,000 lb. Carry Capacity

The Model H-90 has more Carry Capacity than comparable machines weighing as much as 3,000 lbs. more. Its Lifting Capacity is 15,000 lbs., but its *Carry Capacity* is 9,000 lbs., which means that you can use buckets up to 4 cu. yd. (SAE Rating) depending on the weights of materials to be handled. A breakout force of 21,000 lbs.—almost the weight of the machine—can be applied to the bucket cutting edge.

Choice of Four Engines

You have a choice of four heavy-duty engines: a 125 hp Hercules or 134 hp I-H for gasoline; 122 hp Cummins or 126 hp GM Diesels.

Easy Operation, Long Life

Power-shift transmission with 3 speeds forward and reverse, torque-converter, twin-cylinder power-steer and 4-wheel power brakes assure fast, easy operation all day long. Power-transfer differentials and heavy-duty planetary final-drives provide high traction and axle reliability for all ground conditions. Sealed front wheel brakes prevent scoring and glazing. Large oil-bath air cleaners and cartridge-type oil filters protect the engine, hydraulic oil and transmission-torque converter oil.

More Attachments - More Uses

The widest choice of attachments is available, including these "Payloader" exclusives: Drott 4-in-1 Bucket, Superior Sideboom, Galion Vibratory Compactor, Ram Black-top Spreader.

HOUGH®



THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY



The FRANK G. HOUGH Co.

706 Sunnyside Ave.
Libertyville, Ill.

Send data on new
Model H-90 PAYLOADER

Name _____

Title _____

Company _____

Street _____

City _____ State _____

1-6-2

Water storage tank,
Ft. Shafter, Hawaii
U.S. Army Corps
of Engineers
Contractor:
John Scully Co.,
Honolulu, T.H.



Difficult Battered-Wall Tank Simplified With Gates

Army specifications on this 62' diameter water storage tank called for the 24'-high wall to taper from 18" at the base to 10" at the top.

Using Gates Vertical Rod System and color-coded PlastiCone ties, the contractor first erected the inside form to full wall height. Inside form bracing was minimized by using the heavy studs and shoring required to support a future concrete roof. The outside forms were "floated" to eliminate all exterior bracing, and the wall was poured in three 8' lifts.

The contractor was well pleased and stated, "Gates produced the finest concrete and truest radius of any job I have ever done." This with an inexperienced crew... and Gates.

Let your nearby Gates Representative show you how to simplify your difficult forming jobs. Or, write us direct:

Gates & Sons, Inc.

80 S. GALAPAGO STREET

DENVER 23, COLORADO

Branches in Spokane, Rochester and Lethbridge

CM 1/59

LOW COST POWER
for WRECKING-SMASHING
FREDERICK CAST Semi-Steel
DROP BALLS

Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting... deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstanding greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloy furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.

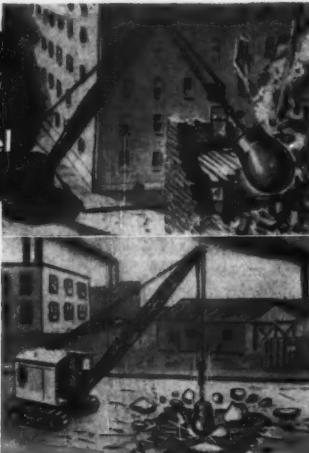
Wide range of sizes and weights:
Pear shape (lbs.) 1500 2000 3300 4000 5200 6500 8000 10,000
Ball shape (lbs.) 500 1000 2000 5200
Spherical shape (lbs.) 470 950 1650 2400 3000 3700 5400 6,900
(*"manet use")

Write us today for prices and illustrated literature; order Balls direct or see your nearest Equipment Dealer.

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Makers of Manhole Frames, Covers and Steps • Storm Gratings
Meter Frames and Covers • Centrifugal Pumps • Grey Iron Castings



SALES AND SERVICE...

continued

In the Main Office

Bucyrus-Erie Co.: Robert G. Allen has been elected president in charge of all operations. He succeeds William L. Little, who will continue as chairman of the board and senior officer. Allen joined Bucyrus-Erie in 1957 as vice president and was made executive vice president later that year. Little was elected vice president in 1943, president in 1952 and has been chairman of the board since 1957.

Gardner-Denver Co.: Charles M. George has been elected vice president and general manager for operations of two plants at the firm's Chicago headquarters. Aubrey H. Jones, vice president and director of the export division, has been elected president of Gardner-Denver International, C. A., a new subsidiary.

Armco Steel Corp.: E. Roy Grant, formerly manager of the Rocky Mountain Division of Armco Drainage & Metal Products, Inc., has been elected vice president and division manager.

Associations

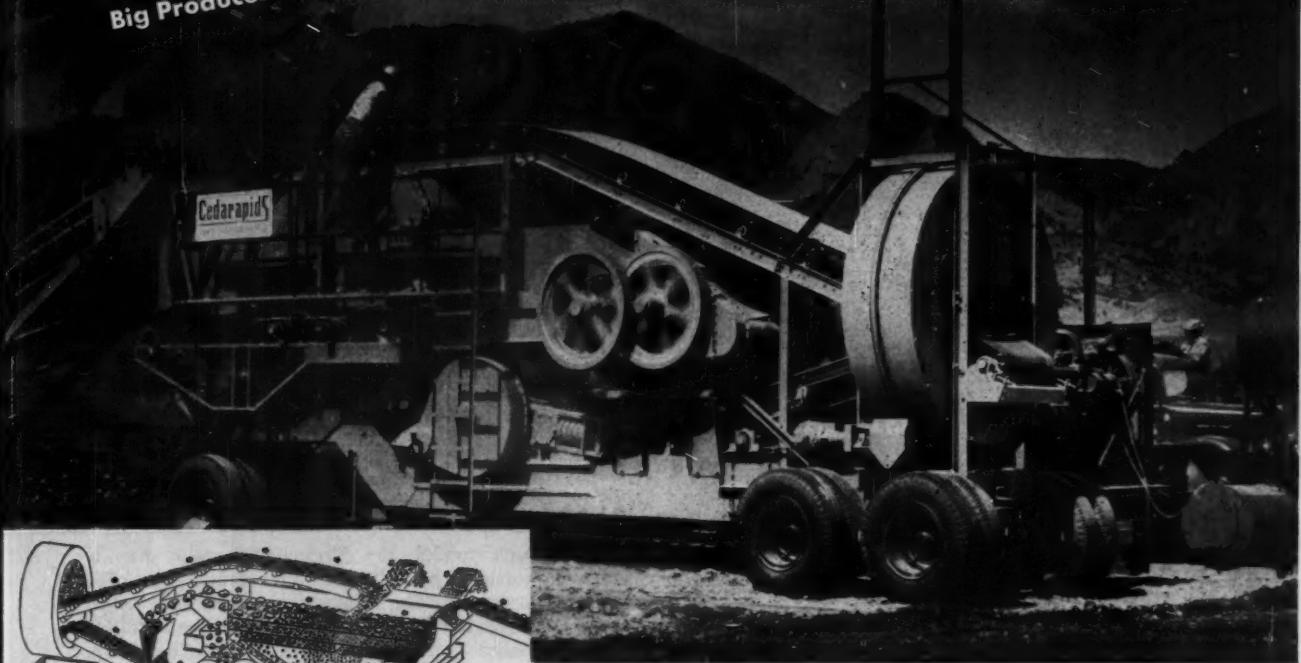
Portland Cement Association: Cris Dobbins, president of the Ideal Cement Co., has been elected chairman of the board of the Association. He succeeds George E. Warren, president of Southwestern Portland Cement Co. Hugh D. Barnes was appointed assistant vice president and Anthony G. Sabato was named auditor. Warren G. Burres has been appointed district engineer in Los Angeles and will be replaced as manager of personnel training by Walter E. Kunze, Jr. Field service activities have been extended into northern California and Oregon through establishment of offices in San Francisco and Seattle.

Special Mention

Johns-Manville Corp.: The corporation has bought the assets of L.O.F. Glass Fibers Co. on the basis of one share of J-M common stock for each 2 1/2 shares of the glass company's stock. In 1957 L.O.F. Glass Fibers reported net sales of \$23 million. Johns-Manville sales in the same year were \$308 million.

Cedarapids'
NEWEST
Big Producer

CHALLENGER



THE MOST VERSATILE PLANT EVER DESIGNED

For 100% crushed or fractured product, you can feed the Challenger from the front (as shown in the flow diagram) to by-pass all sand and fines. Or feed it from the rear when the percentage of crush isn't important. With six different screen deck arrangements, you can produce a single product, add another size of rock, or chips, or sand, or produce all four . . . take off each size separately or blend them in the desired proportion.

The Challenger's triple deck horizontal vibrating screen is a compact 48" x 14' size for portability. Its efficient design assures extremely high capacity per square foot of screening area, eliminating the need for a large, bulky screen.

TYPICAL PRODUCTION REPORTS

"My new Challenger is producing over 500 tons per hour of $\frac{3}{4}$ " minus, with 35% crushing."

"By using a rock chute over the Challenger's screen, all sand is removed before it enters the circulating load. The plant is producing 220 tons of $\frac{3}{4}$ " material per hour, crushing 65%."

"My Cedarapids Challenger has tough going in wet, sticky material, but it's turning out $\frac{3}{4}$ " minus product at a 240 to 300 tph rate."

"I'm meeting 100% crush specifications with my Challenger and producing around 130 tons of $1\frac{1}{4}$ " material per hour. A Cedarapids Twin Jaw Intermediate Crushing and Screening Plant is working ahead of the Challenger."

THE PLANT WITH THE TWIN JAW PRIMARY

40% to 100% greater primary capacity!

Big tonnages—1 to 4 sizes!

100% crushed or fractured material—or blended

Now Cedarapids puts a Twin Jaw Crusher in this new portable plant to step up primary crushing 40% to 100% over plants with a single-jaw primary of comparable size.

The Twin Jaw combines overhead eccentric, force-feed design with *two synchronized movable jaws operating at high speed* to provide a high velocity jaw action for big capacity crushing of even hard material.

You can operate the Challenger with the primary jaw opening reduced . . . this means you can produce a greater percent of crushed or fractured aggregate. It reduces the circulating load and increases overall plant capacity, since a high proportion of material is crushed to finished size by the Twin Jaw alone. Material fed to the roll crusher can be smaller in size, thus increasing efficiency and capacity of the secondary crusher.

Maintenance is low on the Challenger. Twin Jaw design gives 5 to 8 times longer jaw life than single-jaw crushers because rubbing under pressure is practically eliminated. Think what this means in hard, abrasive material! And because the Twin Jaw crushes a much greater proportion of material than the roll crusher, wear on the secondary crusher is reduced.

WHY WAIT? GET FULL DETAILS TODAY

You'll want to know more about this revolutionary new plant that's setting production records in State after State. There's a new Bulletin that describes every feature. Send for it today, or see your nearby Cedarapids Dealer.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Cedarapids
Built by
IOWA

Construction Equipment News . . .



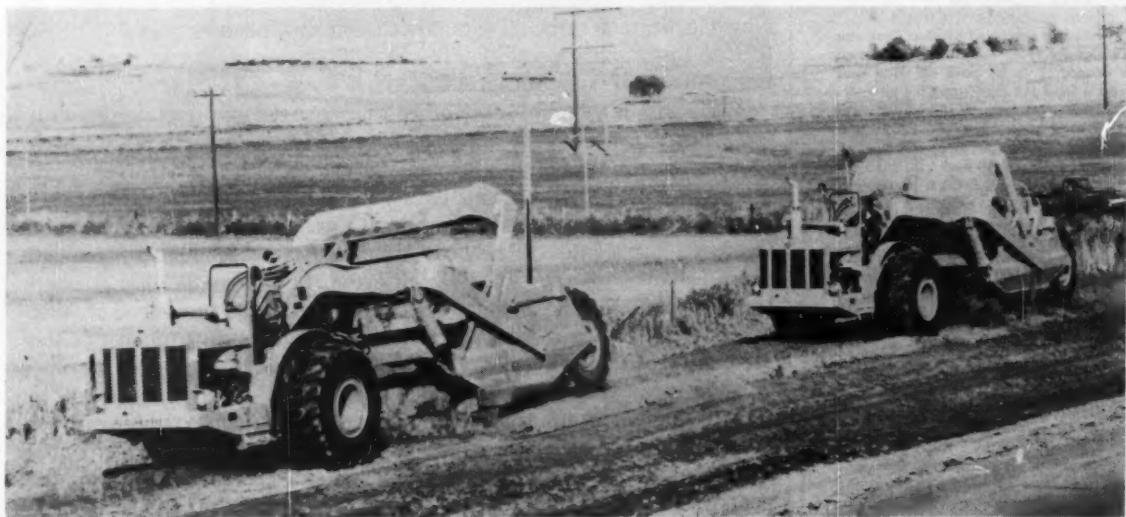
Fork Trucks for Rough Terrain

Clark's two new Ranger fork trucks are designed for high-speed materials handling over rough terrain. Both the 4,000-lb and 6,000-lb models offer two and four-wheel drive. A feature of both is "bi-angular" steering; the rear axle turns 28 deg and the rear wheels turn another 28 deg to give the rig a 56-deg turn. This provides a short turning radius in spite of a long wheelbase. Two hydraulic levers control lifting and tilting movements of the forks, which have a lift speed of 100 fpm. The trucks can travel at 23 mph.—**Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.**



Discharges Over the Front

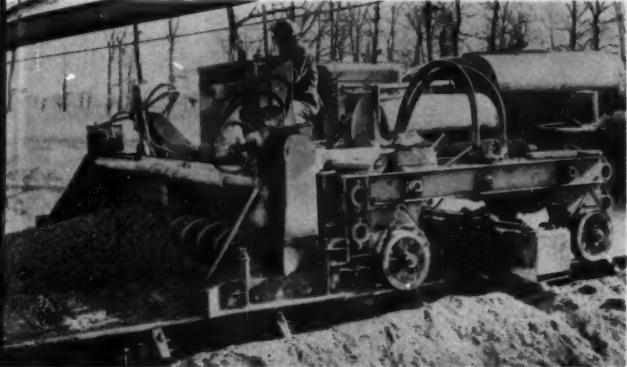
The Parsons model 250 Trenchliner now has a front-end discharge conveyor that loads spoil directly into trucks. The conventional side-discharge conveyor and the off-set boom still are available. The front-end conveyor mounts within the main frame of the trencher and extends out over the power unit. It offers 10½ ft of dumping clearance. The cleated, 24-in. wide belt is powered by an auxiliary engine. The conveyor frame is hinged to reduce overall length when the trencher is transported. The model 250 digs from 16 to 42 in. wide and to 12½ ft deep.—**Parsons Co., Newton, Iowa.**



New Scraper Offers Good Horsepower-to-Weight Ratio

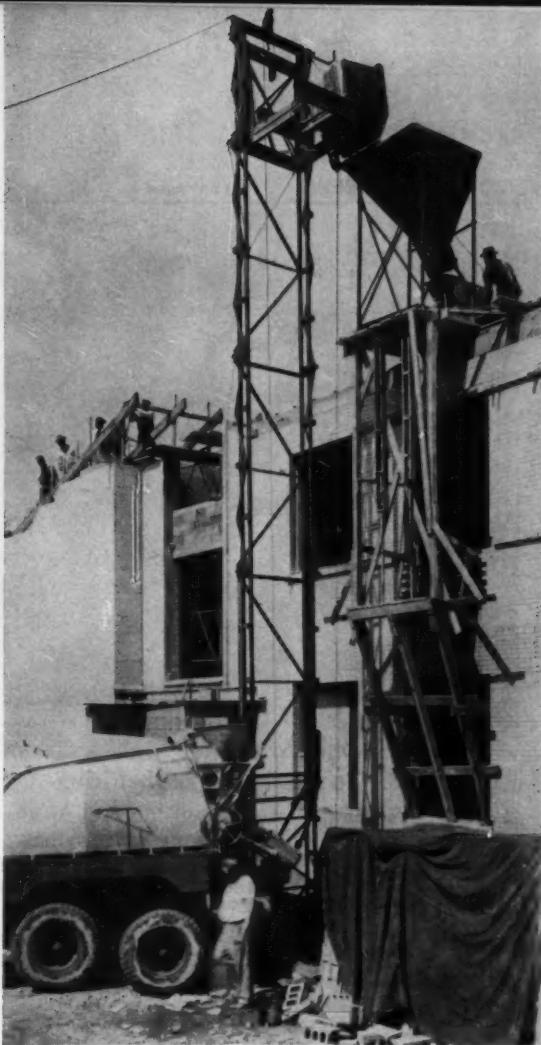
Allis-Chalmers' new medium-sized scraper carries 12½ yd struck and 17 yd heaped. Called the TS-260, it is powered by a new Allis-Chalmers 230-hp diesel that gives the rig a horsepower-to-gross-weight ratio of 1:370. The hydraulically operated scraper

bowl is 116 in. wide and 53 in. high. It features forced ejection and an apron opening of 100¾ in. Tractor features include a 17-in. single-plate ceramic clutch; constant-mesh transmission; torque-proportioning differential; and large, synchronized air brakes. A 90-deg steering system allows the rig to turn 180 deg in 29 ft.—**Allis-Chalmers Mfg. Co., Milwaukee, Wisc.**



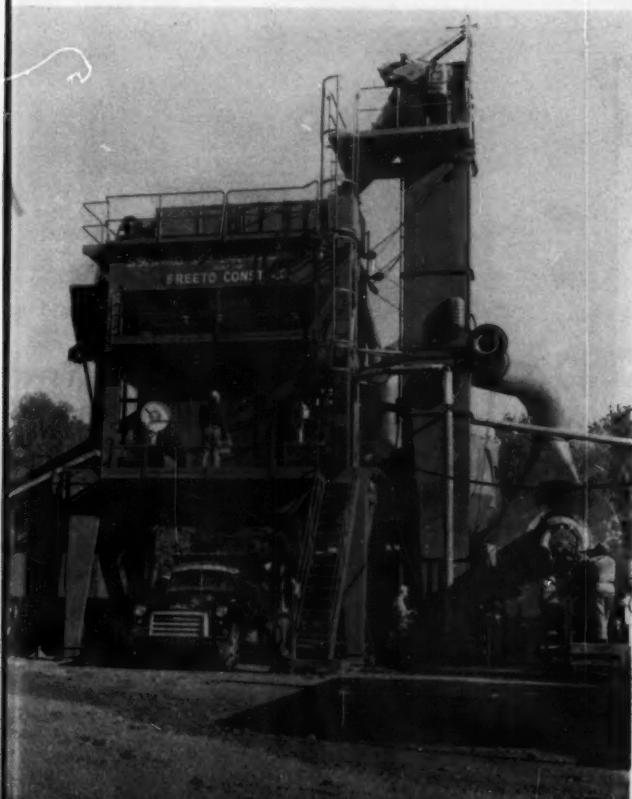
New Spreader Adjusts Easily

Jaeger's new JSX spreader features adjustable self-widening and a diagonally adjustable finishing screed that lays material up hill and compacts it solidly against the upper form on rising curve elevations. All operations—traction, spreading, screeding, and width changes—are handled hydraulically through fingertip levers. The strike-off bar is adjustable from as much as 5 in. below to 6 in. above forms. It is followed by a 12-in. oscillating screed. Machine width can be adjusted infinitely from 12 to 18 ft while the machine is in motion.—Jaeger Machine Co., 625 W. Spring St., Columbus, Ohio.



Push Buttons Control Hoist

At the touch of a button, the new Buck HoisTower lifts 2,500-lb loads at a rate of 160 fpm. The hoist can be operated by remote control either from the ground or from any floor on a building job and it is pre-set to deliver its load to a given height. The machine also can be fitted with a concrete bucket that dumps automatically. Powered by a 25-hp Wisconsin engine, the tower is electrically actuated through its self-contained 12-v dc power system. The tower is self-erecting to 45 ft and extra tower sections can be added.—Buck Equipment Corp., 720-X Anderson Ferry Rd., Cincinnati 38, Ohio.



Asphalt Plant Is Self-Erecting

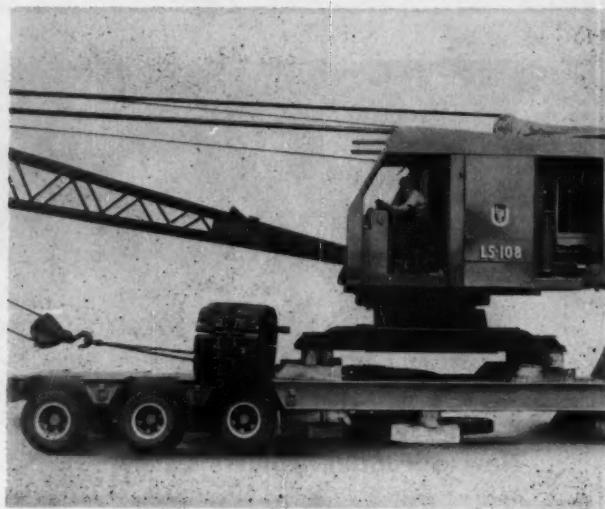
Standard's model S-E portable asphalt plant features a self-erecting device that enables the plant to be put in place without the need for a crane. The plant can be set up in three days, according to company engineers. After the units are carried by trailer to the job site, the powered hoist section is positioned and the mixing unit is pulled directly under it. The plant then erects itself. The dryer, dust collector, and other components are supported on built-in jack legs. Models with capacities of 4,000, 5,000, and 6,000 lb are available.—Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58, Calif.

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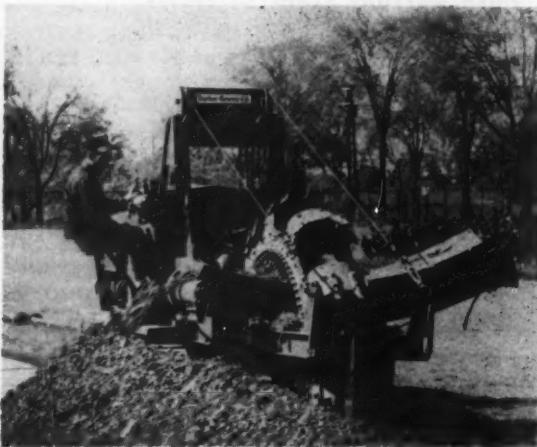
Roller Has Controls on Both Sides

Buffalo-Springfield's new 10-30-ton, seven-wheel pneumatic roller has four driving wheels that are powered by a 125-hp Cummins diesel. Operating controls on both sides of the roller include hydraulically boosted power steering. The two operator seats are adjustable through a 360-deg arc in 90-deg increments. All wheels oscillate. Tires are 13.00-24, 18 ply. A three-speed transmission and torque converter provide speeds up to 19.4 mph.—Buffalo-Springfield Roller Co., Springfield, Ohio.



Crane Strips to 32,000 Lb

Link-Belt's 40-ton LS-108 crane can walk with more than its own weight. The crane's 15-ft long, 14-ft wide crawler base gives it exceptional stability. The machine can pick up and handle 160 ft of boom and jib. Features include Speed-o-Matic hydraulic controls and an independent boom hoist with power for both up and down movements. Options include a torque converter and reversing clutches for main drums. The rig strips to 32,000 lb.—Link-Belt Speeder Corp., Cedar Rapids, Iowa.



Crowds Without Shifting Gears

Barber-Greene's model 773 dumper, which digs 5 1/2 ft deep and 14 to 24 in. wide, features a new transmission that eliminates gear shifting for crowding speeds. Other features are a flexible drawbar design that permits the rig to dig on curves without twisting; a new engine mounting that puts transmissions in easily accessible positions; and a clutch that provides automatic overload protection. The 773 has 14 or 16-in. wide crawler pads. A similar rig, the 772, has 10-in. pads.—Barber-Greene Co., Aurora, Ill.



Compact Pump With Big Capacity

The compact, 86-lb Motorborr Weda L3 submersible pump will discharge up to 265 gpm against a head of 16 ft. The Swedish import, which has a 3-in. discharge line, is only 10 1/2 in. in dia and 18 1/2 in. high. One man can carry it easily. The pump needs no priming and it is fully submersible. The motor is protected by a double shaft seal. The body is made of hydronium, an aluminum alloy that resists corrosion even in salt water.—Motoramic, Inc., 67-11 Main St., Flushing, N.Y.

continued on page 164

Build your own $\frac{3}{4}$ yard Lorain-26 at the price you want to pay

Now you can buy a $\frac{3}{4}$ yard Lorain-26 with everything you want in it but no more than you need. You select the "package" you want—whether dragline, clamshell, shovel, crane or hoe, and you'll get the properly balanced machine to do your job best.

You buy only what will pay off for you . . . without unneeded extras that can boost initial cost and don't necessarily make any more money for you.

And you'll be amazed at the lower prices your Lorain distributor can quote you. Check and compare what he has to offer you on this $\frac{3}{4}$ yard workhorse. You'll find you'll get more—and pay less. See him today.



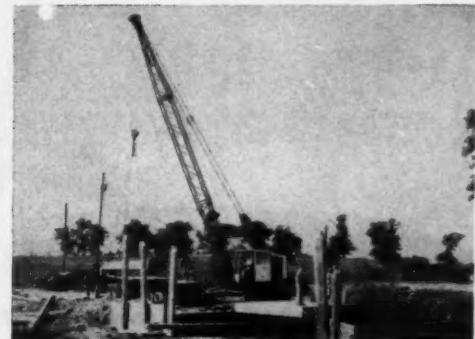
LOW COST DIGGING PACKAGE

A heavy duty shovel-hoe without excess weight on a digging crawler. Shovel boom is all-welded, with cable crowd, power dipper trip. Welded gooseneck-tapered hoe boom. Power plant, clutch and hoist shafts contribute to counterweight effect. And the price is right.



DRAGLINE AND CLAMSHELL PACKAGE

Hoist drums have anti-friction bearings for faster casting. Long life swing clutches speed action. Revolving fairlead has anti-friction bearings. Special gearing for more efficient dragline work. Special dragline boom available for greater operating ranges. And the price is right.



18-TON CRANE PACKAGE

Lorain's exclusive Square-Tubular-Chord Boom is lighter, stronger, permits greater payloads. Big crawler, simultaneous hoist, swing and travel available. Hydra-Ease crawler controls. All control linkage mounted on anti-friction bearings. And the price is right.

LORAIN®

THE THEW SHOVEL COMPANY, LORAIN, OHIO

Ask your nearby Lorain distributor for the full story—and about his on-the-spot parts and service facilities that add so much when you buy a Lorain.

OWEN

Engineering scores again

Never before have so many important and improved features been combined in a material handling bucket as in the new OWEN Center Line Reeling clamshell buckets . . . redesigned from bowl to head.

OUTSTANDING IS THE 75% TO 100% INCREASE IN CABLE LIFE.

Here's how it's done. The closing line now leads straight through the center plane of the head of the bucket to first lower sheave, thus eliminating bending of the closing line around upper guide sheaves as in conventional block and tackle buckets.

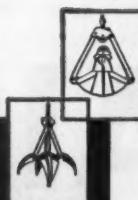
A complete line in three models . . . "KCL" Standard Material Handling Bucket . . . "SCL" Wide Barge Type Bucket . . . "CCL" Light Material Bucket. Available in sizes from 1/4 to 10 cubic yards.

Write today for additional information.

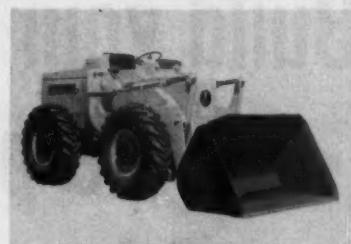
The OWEN BUCKET Co.

BREAKWATER AVENUE, CLEVELAND 2, OHIO

BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.



EQUIPMENT NEWS... continued



Payloader Improved

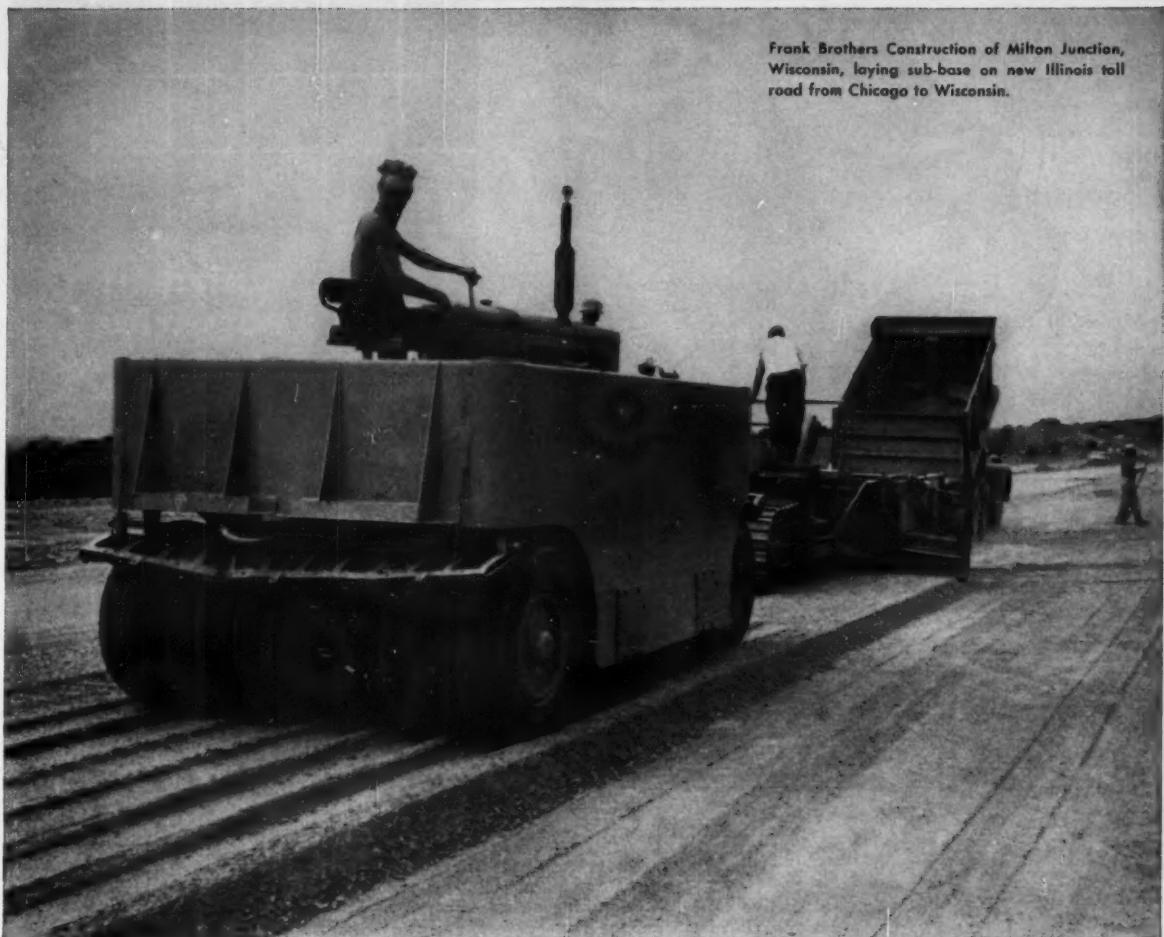
A new H-90 Payloader will replace Hough's former HO model. Both gas and diesel power units are offered. Buckets are available in sizes from 1 1/2 to 5 yd. The loader features a low-profile front shroud that gives the operator improved visibility. Breakout force is 21,000 lb and bucket tipback is 44 deg at ground level. A cartridge-type oil filter is built into the engine hydraulic reservoir. There are separate oil filters for the engine, transmission, and torque-converter. Other features include power-transfer differentials, twin steering-booster cylinders, power-boosted brakes on all four wheels, and sealed front brakes.—Frank G. Hough Co., 706 Seventh St., Libertyville, Ill.



Smaller Hiab Crane

The new Stanco truck crane is a fully hydraulic, one-man operated rig that requires only 10-in. of space behind the cab. This Hiab Model 290 swings in a 200- or 360-deg arc and will lift to 18 ft 4 in. above ground level. The shortened 6-ft boom will lift 2,200 lb and the full length 11-ft 6-in. boom lifts 1,100 lb. An optional winch for the Hiab 170 crane (insert) allows it to work below grade and up to 20 ft above ground level with a winch speed of 20 in. per sec. The winch has a line pull of 2,300 lbs and spool capacities up to 150 ft.—Stanco Mfg. & Sales, Inc., 1661 Ninth St., Santa Monica, Calif.

continued on page 167



Frank Brothers Construction of Milton Junction, Wisconsin, laying sub-base on new Illinois toll road from Chicago to Wisconsin.

New toll road takes small toll on equipment thanks to Cities Service lubricants!

Laying sub-base for a 15-mile stretch of the new Illinois toll road is no easy task . . . especially when there's a 140,000-yard rock cut to be removed.

Rock or no rock, Frank Brothers must get the job done on time or they'd idle the paving contractors working the stretch directly behind them.

To do this, Frank Brothers' crushing plant and its many earthmovers and graders must operate without breakdown—without headache. And they do just that, thanks to Cities Service C-500 Motor Oil and other fine Cities Service products.

Recommended for Caterpillar diesel engines operating under the most severe service, Cities Service C-500 Motor Oil has the highest level of detergency-dispersion . . . a good reason why Frank Brothers' equipment stays on the job, hour after grueling hour.

"Not only is our Cities Service lubrication flawless, but we get the best possible field service wherever we go," says Phillip Frank.

If you're not getting just that from your supplier, talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

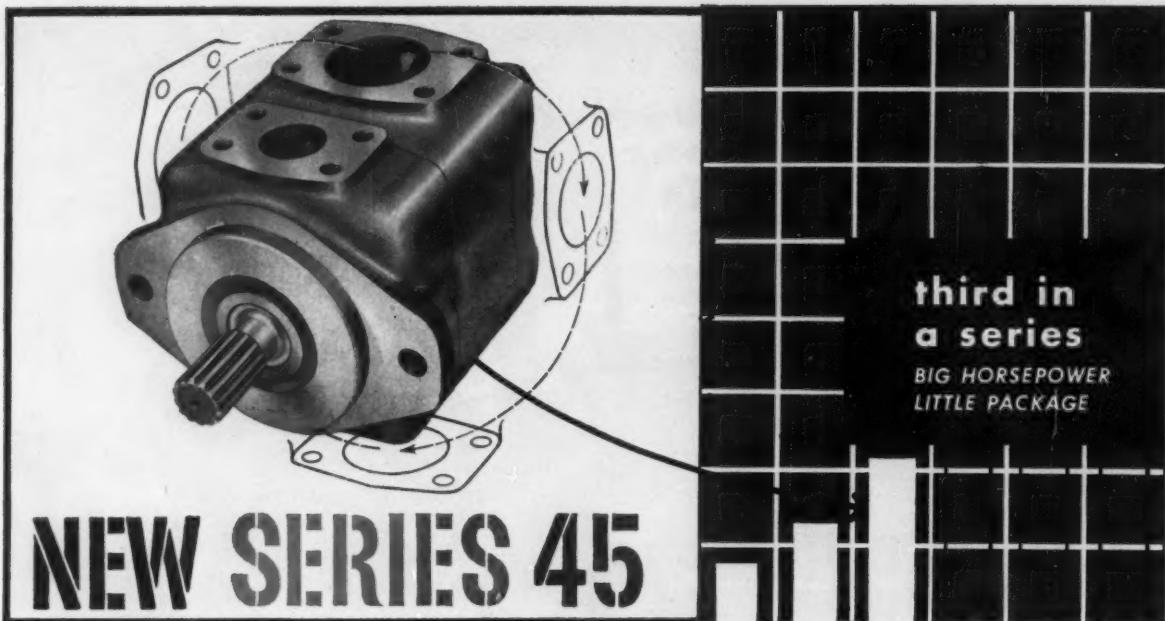


"Wherever We Go, Cities Service provides excellent on-the-spot service to keep things running smoothly," says Phillip Frank. Portable crushing plant here produces 2,300 cu. yds. of sub-base per day.

With No Time To Waste, Frank Brothers' equipment must operate constantly without breakdown. "We do it with Cities Service Gasoline, Diesel Fuel and C-500 Motor Oil," says Mr. Frank.



CITIES  **SERVICE**
QUALITY PETROLEUM PRODUCTS



*PATS. & PATE. PENDING

VICKERS. "high performance" vane pump

- high speed • high pressure • high efficiency • high service life

NEW COMPACT DESIGN . . . much more horsepower than previous pumps of the same package size.

NEW VANE CONSTRUCTION . . . positive vane tracking at all operating speeds assures efficient operation at increased speeds and pressures.

NEW SIZES not previously available . . . answers mobile equipment designers' need for greater hydraulic horsepower in limited space.

NEW PARTS INTERCHANGEABILITY . . . many common parts for single and double pumps (two pumps on the same shaft in one envelope). Lessens inventory requirements.

NEW 4-BOLT SAE FLANGE CONNECTIONS . . . will also accommodate user's 2-bolt flanges of the proper design.

NEW 2-BOLT MOUNTING (SAE 1959 STD.).

NEW 4-POSITION COVER . . . outlet can be rotated in 90° increments with respect to inlet.

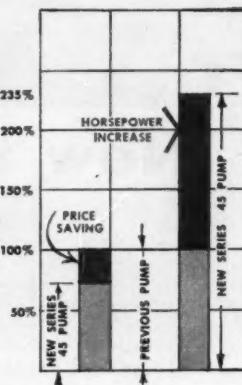
NEW REPLACEABLE PUMP-ING CARTRIDGE . . . all wearing parts of pump are incorporated in one replaceable cartridge. Easy field replacement without removing pump from its mount. Cartridges available in kit form.



MUCH MORE HORSEPOWER PER DOLLAR

The striking increase in horsepower per dollar of the Series 45 over previous pumps of the same delivery capacity is shown in the graph to the right. Maximum horsepower is more than double (235%) and price is lower by 35%.

This is the third unit released in the new complete line of "High Performance" Pumps, single and double. The first (Series 25) is available in 12, 14 and 17 gpm sizes and the second (Series 35) comes in 21, 25 and 30 gpm sizes (at SAE rating of 1200 rpm and 100 psi). This new Series 45 pump is available in 35, 42 and 50 gpm sizes.



The table below shows characteristics

Model Number	Delivery—gpm		Input Horsepower @ 2000 rpm 2000 psi	Package Size	Weight
	1200 rpm 100 psi	2000 rpm 2000 psi			
2V35A-1*10	34	52	71	L. 7 3/4" W. 6 1/4" H. 6 1/2"	69 Lbs.
2V42A-1*10	41	63	86		
2V50A-4*10	48	75	103		

†Exclusive of Shaft Extension and Mounting Lobes

8201

Write for new illustrated Bulletin No. M5108 for further details and performance characteristics.

VICKERS INCORPORATED

DIVISION OF SPERRY RAND CORPORATION

Mobile Hydraulics Division

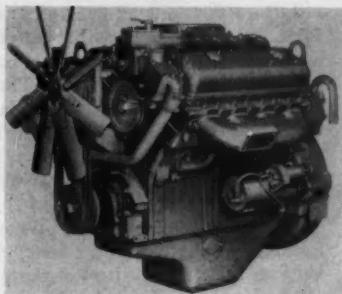
ADMINISTRATIVE and ENGINEERING CENTER
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CLEVELAND • DETROIT • GRAND RAPIDS • HOUSTON • LOS ANGELES
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*ALSO SOLD AND SERVICED IN AUSTRALIA, ENGLAND, GERMANY & JAPAN
IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto, Montreal & Vancouver*

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

EQUIPMENT NEWS... continued



WIDE RANGE—Detroit Diesel now offers single-engine power units from 20 hp (right, powering welder) to 675 hp. Typical of new V-type Series 71 engines is eight-cylinder, 334-hp model 8V-71 (above).



Detroit Diesel's New Line Covers 20 to 1,650 Hp

GENERAL MOTORS' Detroit Diesel Engine Division this month expands its line of two-cycle diesels to include 19 V-type, in-line, and multiple-engine units that have a range of from 20 to 1,650 hp—the largest spread in the diesels field.

The new diesels are V-type Series 71 engines with 252, 334, 504 and 675 maximum brake horsepower ratings; two, three, and four-cylinder in-line Series 53 engines with 47, 97, and 130 maximum horsepower ratings; and a six-cylinder, V-type Series 53 engine rated at 195 maximum horsepower. In addition to 6-71 and 110 multiple-engine units, two new "twins" with maximum ratings of 1,008 and 1,350 hp are available.

When turbocharged, the largest twin, the model 16V-71, will deliver up to 1,650 maximum brake horsepower. All the new engines from the 195-hp 6V-53 size on up soon will be available with turbochargers. Turbocharging will raise power ratings by 30%.

"These new engines expand our line considerably," says Robert E. Hunter, Detroit Diesel's general sales manager. "Formerly, some users had to either downgrade or overload an engine because of gaps in our horsepower range. Also, our new Series 53 engines can handle many applications in the lower power ranges that previously were not suited to the diesels then available."

Main features of the new power plants are maximum parts interchangeability, compact size, and low weight-to-horsepower ratios.

For the entire line, there are only three cylinder sizes. Pistons, rings, valves, valve operating mechanisms, injectors, and many other parts are interchangeable—engine for engine—throughout each series. The Series 53 engines even use some Series 71 items, such as parts for injectors, push rods, cam followers, and throttle controls.

The main differences between the V-type engines and their in-line counterparts are the crankshafts and cylinder blocks. The Series 53 engines are basically scaled-down versions of Series 71 units. Maintenance of the new engines will present no problems to mechanics who are familiar with previous engines in the Detroit Diesel line.

The V-type configuration of the new Series 71 units, along with their two-cycle design, makes them extremely compact. In most instances they can be installed in space ordinarily occupied by engines of less horsepower.

The new 334-hp 8V-71, for example, is almost 6 in. shorter and takes up 8% less space than the 252-hp Detroit Diesel 6-71E in-line engine. The same 334-hp engine is nearly 15 in. shorter and 2 1/8 in. narrower than the 335-hp 6-110 in-line engine.

continued on next page

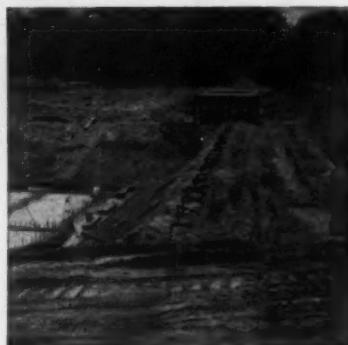
HOW TO HANDLE WET JOBS

ONE LIFT REMOVES 18 FT OF WATER FROM "PATCH-QUILT" SOIL

Sewage treatment plant, Clayton, N. J.
Contractor: C & T Affiliates, Inc.



SOIL on this job varied by area—fine silty sand here—coarse sand there—gravel a few feet away. This "patch-quilt" pattern precluded routine handling.



GRiffin engineers carefully planned proper installation for each wellpoint, using sand filters on some but not others.

This plus other special methods lowered the 18 ft of water with a money-saving single-stage wellpoint system. Top photo shows system placed directly at water level.

GRiffin

WELLPOINT CORP.

881 East 141st Street, New York 54, N. Y.

Hammond, Ind. Houston, Tex. Jacksonville, Fla.

West Palm Beach, Fla.

In Canada: Construction Equipment Co., Ltd.

Toronto Montreal Halifax

EQUIPMENT NEWS... continued

Once Again Ernest is first to present Black Diamond

'PAD-LOK'
nuts, safest, surest way to lock track pads on all CATERPILLAR TRACK ASSEMBLIES!

Be safe... be sure, with PAD-LOK nuts. High Carbon steel, double heat-treated, PAD-LOK nuts can be used over and over again. Unaffected by heat or cold. Send for prices and literature.

And, don't forget GROUSER STEEL. Ernest cuts it to any length you require. Genuine Black Diamond Grouser Steel is your insurance against DOWN-TIME!

Black Diamond Tractor Bolts are acknowledged top quality in the industry. Use them with PAD-LOK Track Shoe Nuts. Write today for complete prices and information on all these quality products.

TELEPHONE
Winton 1-4000

EARNEST MACHINE PRODUCTS CO.
12716 TRISKETT ROAD • CLEVELAND 11, OHIO

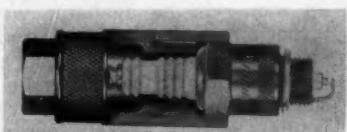
For scrapers, graders, and tractors this means smaller engine compartments that provide better visibility and balance. Their compact size also allows contractors to power-up their rigs by exchanging present engines with engines of the same size but with more power output.

A weight reduction is another inherent feature of the two-cycle, V-type design. Additional weight savings were achieved in the new engines by reducing casting-wall thicknesses wherever possible. In the new 6V-71 engine the V-block configuration, short crank-shaft, and careful attention to light-weight construction combined to reduce the engine's total weight by more than 300 lb.

The two-cycle engine design produces power on every piston down-stroke instead of on every other stroke, as is the case with four-cycle engines. Besides reducing weight and size, the two-cycle design is said to provide more horsepower-per-cu-in. of displacement and to suffer less power loss at high altitudes.

One big design feature of the entire line is a uniflow scavenging system. By inducting air through inlet ports around the entire lower periphery of the cylinders and exhausting it through the cylinder heads, a maximum air flow is achieved and pumping losses are held to a minimum.

Another feature is that fuel supply and spill passages are now drilled in the cylinder heads. This design supplants the previous external, fabricated fuel manifolds and provides greater flexibility while eliminating several vulnerable parts.—Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Drive, Detroit, Mich.



Spark Plug Socket

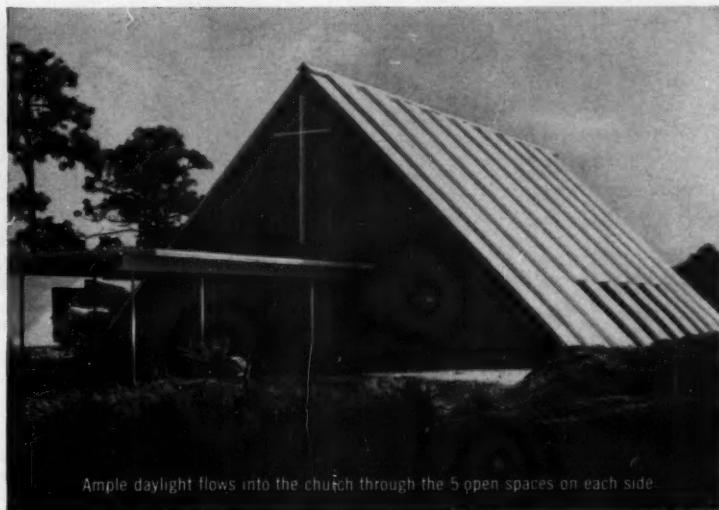
A magnetic spark plug socket adaptable to any standard $\frac{3}{8}$ -in. drive wrench or extension has been introduced by Champion. Called the Plug-mate, this deep-well, thin-walled 13/16-in. socket

continued on page 174



Working together, two cranes position prestressed slabs. 20 slabs are $5\frac{1}{2}$ " thick, 4' wide and $38\frac{1}{2}$ ' long; 8 slabs are 4" x 4' x $38\frac{1}{2}$ '; there are 10 shorter slabs 4" x 4' x 30'.

NEW CHURCH DESIGN SHOWS VERSATILITY OF **PRECAST, PRESTRESSED CONCRETE**



Ample daylight flows into the church through 5 open spaces on each side.

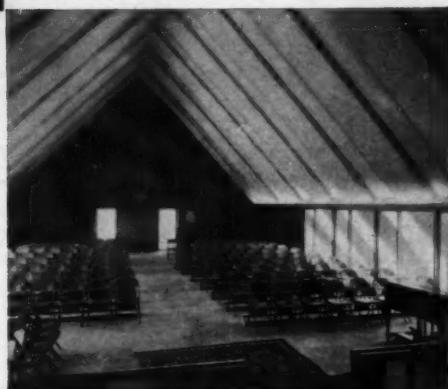
• The St. Ambrose Episcopal Church in West Fort Lauderdale, Fla. is another example of the almost unlimited possibilities of modern precast, prestressed concrete construction.

Just 38 prestressed slabs were required for this unique structure. Cast with plates imbedded at the ends and along the sides, slabs were fitted into slots in the footings, hoisted into place and welded together. The joints were coated with roofing material. That's all there was to it.

By eliminating conventional walls and roof, this technique resulted in substantial savings to the owner. The appearance of the completed job speaks for itself.

The prestressed slabs were made with Lehigh Early Strength Cement at the R. H. Wright & Son, Deerfield plant. Its use helps them save time and money in producing a variety of top quality concrete units.

On the interior, prestressed slabs were sprayed with a acoustical plaster.



ARCHITECT: Johnson and McAlpine, Ft. Lauderdale, Fla.

CONTRACTOR: Quick Quality Construction, Inc.,
Ft. Lauderdale, Fla.

PRECAST, PRESTRESSED CONCRETE UNITS MANUFACTURED BY: R. H. Wright & Son, Ft. Lauderdale, Fla.

- LEHIGH EARLY STRENGTH CEMENT
- LEHIGH PORTLAND CEMENT
- LEHIGH AIR-ENTRAINING CEMENT
- LEHIGH MORTAR CEMENT

**LEHIGH
PORTLAND
CEMENT
COMPANY**

Allentown, Pa.



Stationary Lima Austin-Western Crushing and Screening Plant produces high tonnage of accurately sized specification material. Five 20-yd., 2-compartment bins facilitate truck loading.

Lima Austin-Westerns crush, screen...boost output, reduce material costs!

Lima Austin-Western, engineered and quality built to meet your exact needs for accurately sized specification material at low cost. A complete line of portable and stationary crushing and screening plants, setting new high standards for high level production and low maintenance in pit or quarry service.

Line includes jaw and roll crushers in many sizes, matching screens, elevators, conveyors and bins. Apron or reciprocating feeders control material flow, eliminate overloading, choking and surging. Centralized power plants, anti-friction bearings and fewer shafts, belts and gears keep operating costs low.

Get full information now on high output, low cost Lima Austin-Western Crushing and Screening Plants. See your nearest distributor or write us.



Apron type portable feeder shown with a 2540 primary portable plant.



101-SE crushing and screening plant—typical of portable units designed for fast moves and easy setups to reduce haul costs.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA AUSTIN-WESTERN Crushing, Screening and Washing Equipment
BALDWIN • LIMA • HAMILTON
 CONSTRUCTION EQUIPMENT DIVISION • LIMA, OHIO



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"Our LIMA 1250 Crane is really a brute for punishment"

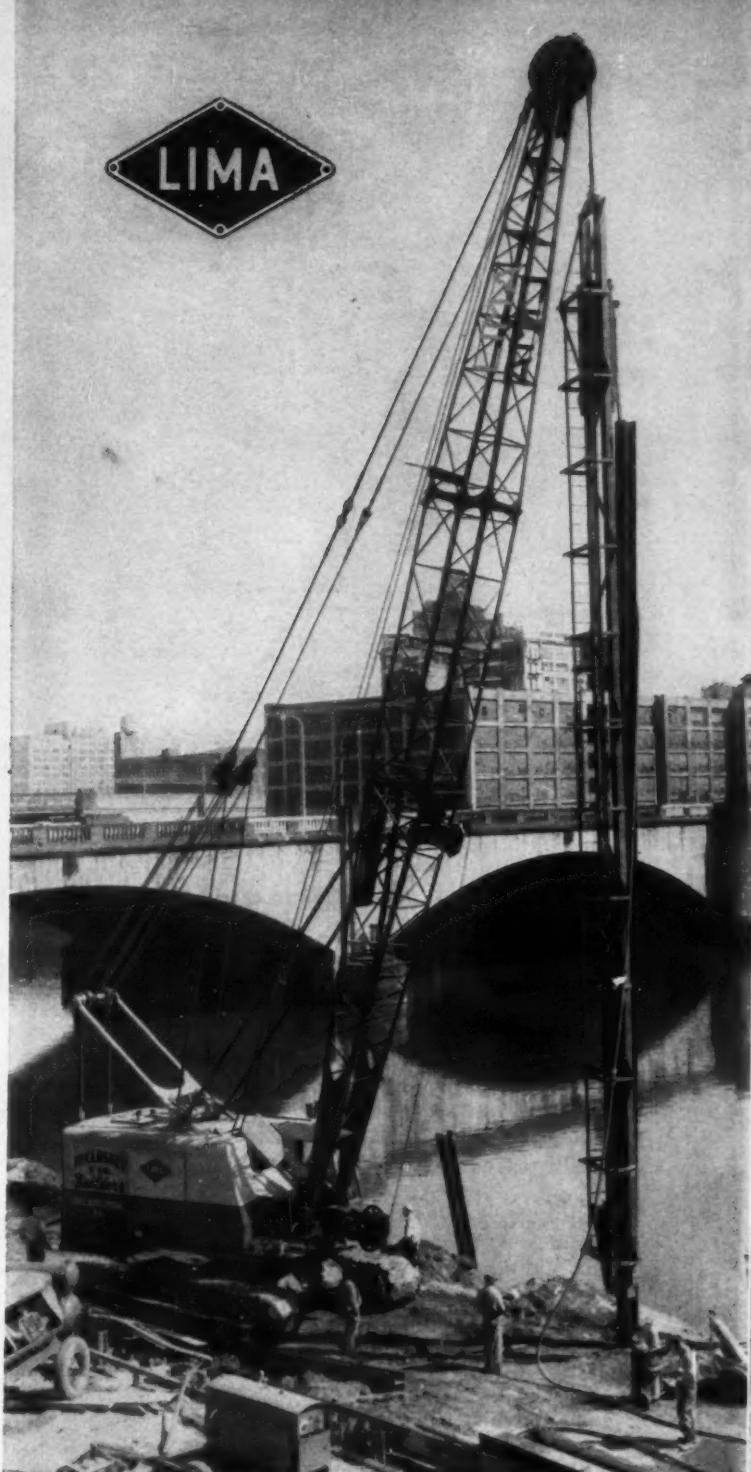
says McCloskey & Co.
Philadelphia, Pa.

A big Lima Type 1250 Crane owned by McCloskey & Co., noted Philadelphia contractor, was used on their \$5,000,000 job in the heart of the Quaker City. Part of this project involved demolishing the century-old Chestnut Street bridge and adjoining seawall. Besides pulling the old pilings out of the bank of the Schuylkill, the Lima had the job of driving 1800 steel piles, 60 ft. long and weighing from 1½ to 2¼ tons each.

Job Superintendent Stanley Czapkewicz says: "Our Lima 1250 Crane is really a brute for punishment and has done an excellent job. I've had a lot of experience with Limas, and know them to be outstanding machines. The Type 1250 Crane more than lives up to expectations.

"Lima service means a lot too. When the crane was delivered, the factory service man helped us with the unloading, then made sure that our operator knew exactly how to handle it. He has since made several follow-through calls. We also know we can count on our local Lima distributor for parts and service any time we need them."

There's a rugged, high-output Lima for every construction need—cranes (to 110 tons), shovels (½ to 6 cu. yds.) and draglines (variable)—crawler, truck and wagon mountings. See your nearby Lima distributor. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



Lima Type 1250 Crane driving piles on bridge building job,
Schuylkill River, Philadelphia, Pa.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON

Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment





One of six Lima Roadpackers on Illinois East-West Tollway Project pauses here for the photographer during vibratory compaction operations on access road.

Six LIMA Roadpackers deliver fast high-density compaction to speed Illinois Tollway job

"We tried all the vibratory type compactors before buying our first Lima Roadpacker in 1957. It proved without a doubt that high-density compaction need not be a slow process," says CKG Associates, Hinsdale, Ill.

Roadpackers meet accelerated schedule

"As our work on the Tollway progressed, we bought additional units to maintain our accelerated production schedule. Today we own six Lima Roadpackers. They speed back and forth to various sections of the job at 30 mph to compact vast quantities of base material as soon as it is spread.

"Reliable compaction, big production, and amazing mobility are the reasons we chose the Roadpacker as our standard compaction tool!"

The Lima Roadpacker is equipped with six shoes, each producing 2200 vertical vibrations per minute to compact from bottom up without shov-

ing action. Fills all voids for high-density consolidation. Entire vibration system completely sealed from dirt. Unit is designed for fast and easy maintenance.

Compaction width variable

Outside vibratory shoes fold back easily for road width clearance to travel without special permit. As necessary, 4, 5 or 6 shoes can be used to vary width of compaction. Roadpackers compact with equal precision forward or in reverse.

You save when you lay fewer courses . . . compact in fewer passes. Lima Roadpackers will produce required density of suitable material in courses up to 12 in. Two-shoe widener attachment available . . . no need for special trench roller.

Get all the facts about economical, high-speed vibratory compaction with the Lima Roadpacker. Write for bulletin or see your Lima distributor.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN • **LIMA** • **HAMILTON**

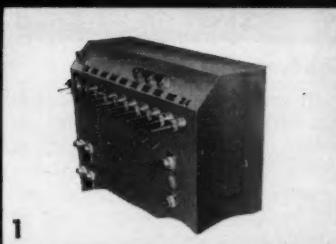
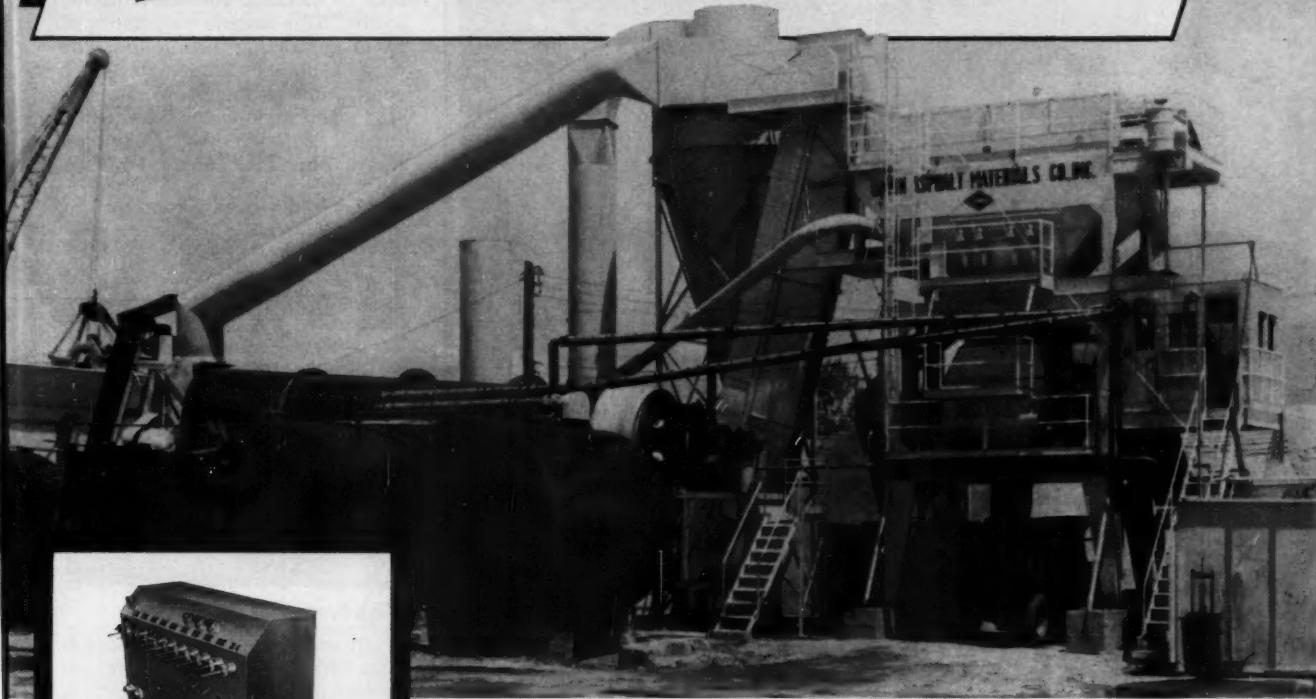
Shovels • Cranes • Draglines • Pullshovels • Roadpackers • Crushing, Screening and Washing Equipment



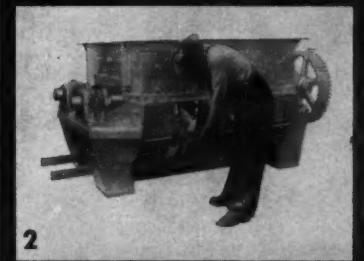
ASPHALT
FEED TUR

UNION ASPHALT MATERIALS CO. Inc., Ostrander, Ohio

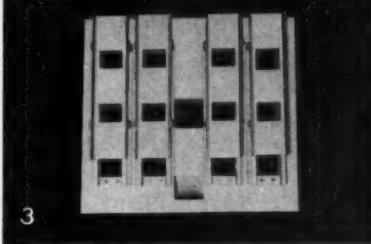
SELECTS THE BIG MADSEN MODEL 481 6000-lb. ASPHALT PLANT



1



2



3



...for FAST PRODUCTION

...for EASY, LOW-COST MAINTENANCE

What do you look for in an asphalt plant? Union Asphalt Materials Co., Inc., Ostrander, Ohio wanted the clean operation, oversize construction, maintenance economy, and the fast production and big tonnage output of the MADSEN Model 481. The MADSEN 6000-lb. plant shown above gives this successful contractor these MADSEN advantages...advantages that can pay-off in greater owner profits for years to come. Three of the outstanding MADSEN features which help provide these advantages are shown at the left.

- 1 **Fast air-cylinder operation** — through conveniently located control console. Levers electrically energize solenoid-operated air valves for faster control of bin gates, weigh-box, mixing, asphalt injection, asphalt charging and dumping to truck.
- 2 **Oversize MADSEN Twin-Shaft Pug Mill Mixer** — for the ultimate in fast, thorough mixing. Curved bottom and center liners are externally removed and installed...an easy 20-minute job per liner section for one man *without getting on the inside of mixer*.
- 3 **Triple discharge bin gates** — for livelier, more efficient bin action. Aggregates are withdrawn from each bin compartment through 3 openings. This MADSEN feature (patent pending) eliminates "coring out" and segregation — results in more uniform filling of the weigh-box.

For complete details on the MADSEN Model 481 Asphalt Plant—See your MADSEN Distributor or write
MADSEN WORKS, P.O. Box 38, La Mirada, California or Baldwin-Lima-Hamilton Corporation, Lima, Ohio.



Equipment that Serves.

COMPLETE PARTS STOCK AVAILABLE
IN LOS ANGELES AND LIMA, OHIO

MADSEN WORKS

LA MIRADA, CALIFORNIA

Construction Equipment Division

BALDWIN-LIMA-HAMILTON



ASPHALT PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS • ROAD PUG TRAVEL MIX PLANTS • WEIGH BATCHERS • DUST WASHERS • FEED BUNKERS
FEED TUNNELS • ASPHALT TANKS • ASPHALT AND FUEL PUMP UNITS • CONCRETE FLOAT FINISHING MACHINES FOR AIRPORTS AND HIGHWAYS • ROYAL CROWN PUMP VALVES



Fast-working Austin-Western Super 99 6-wheel Tandem grader using off-set position to move ditch material up on the shoulder in a single pass along newly blacktopped U.S. 30 in New York State.

Austin-Western 6-wheel tandem delivers brute force when and where you need it

—says Project Manager Irving Haven,
Potter-DeWitt Construction Co., Pavilion, N. Y.

"All-wheel steering on the Austin-Western 6-wheel tandem grader is a real advantage on construction jobs, because it's so easy to steer. Most 6-wheelers are hard to turn, but not the A-W." That's what Project Manager Irving Haven, of the Potter-DeWitt Construction Co., says about the A-W tandem 6-wheel grader.

Quite a machine

"The A-W tandem runs fast and has a lot of traction," Mr. Haven remarks. "You can dog-track with ease. You can grade a shoulder and yet never take your wheels off paving."

"There's more power on the blade, so you can do more work on a wider variety of jobs than with other make graders. The A-W makes ditching and radius work like driveways extra fast and easy. My operators like the tandem A-W because it's so easy to operate. They are a lot less tired after a shift on the A-W than other graders."

No major repairs

"It has real brute force that can be

delivered when and where you need it with ease and precision. We have two tandem 6-wheelers. A Super 88, new in June 1954, has been on the job steady for 4 years without single major repair. Our Super 99 is just a year old, and no problems with it either."

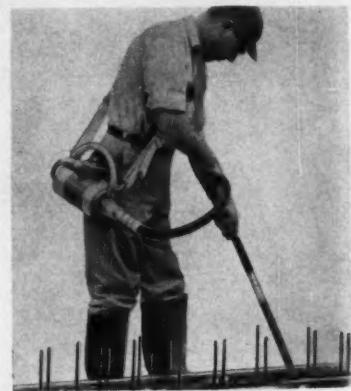
"We are using two tandems and four 4-wheelers on the job. Altogether the company has a total of 12 A-W graders and 3 A-W rollers. I can tell you we get excellent service from our distributor. We're really sold on Austin-Western graders!"

Dependability. Low maintenance. More power. Easy operation. These are a few of the reasons why contractors everywhere are turning to Austin-Western for big jobs where speed and performance pay off in dollar savings!

See your nearby A-W distributor—or write us for complete information about the hydraulically controlled A-W tandem with all-wheel drive and all-wheel steering.

EQUIPMENT NEWS...continued

has a built-in "Alnico" magnet that secures itself to a spark plug by the shell. The insulator is free of metallic contact with the socket. This lessens the chance of breakage during installation. The chrome-plated Plug-mate is a companion to the previously introduced Plug-master flex-handle ratchet wrench. — Champion Spark Plug Co., Toledo, Ohio.



Lightweight Vibrator

Whiteman's new one-man-operated, lightweight concrete vibrator is designed for work in narrow forms, between reinforcing bars, and in other tight places. The head is only 1 5/16 in. in dia. Despite its small size and light weight (16 1/4 lb) the unit produces up to 10,000 vpm. Electrically powered, the entire unit can be slung over the shoulder and carried in a harness.—Whiteman Mfg. Co., 13,020 Pierce St., Pacoima, Calif.



Job Site Batch Plant

The new TPA-TPC portable plant is Erie Strayer's answer to the demand for a fast, low-cost truck mixer batch plant for on-the-job use. The plant, which operates on gasoline or electricity, can be set up in 3 hr and moved easily to keep up with the job. It has a rated capacity of 60 yph of 3-yd

Austin 100th YEAR
PARTNERS IN PROGRESS **Western**
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON
Power graders • Motor sweepers • Road rollers • Hydraulic cranes



batches. The three-compartment bin has a capacity of 28 yd heaped, and silo and auxiliary cement storage totals 625 lb. The plant's two units are mounted on rubber tires and can be moved over the highway by truck tractors. All conveying and batching equipment is attached permanently. The plant comes with bases that eliminate the need for poured foundations in most soils. In the new TPC automatic plant, both charging and discharging valves are air operated. The charging valve is equipped with an electric eye for preliminary and final cut-off. When the start button is pushed cement is weighed and the fill valve closes automatically at the exact weight desired. The cement is discharged from the batcher by pushing a button. Optional equipment includes autographic recorders, bin extensions, water storage tanks, and admixture dispensers.—Erie Strayer Co., 19th & Rudolph Ave., Erie, Penn.



Power Under the Hood

A 2,000-w, 17-amp ac power source that mounts permanently under the hood of a car or truck is now available. The armature is driven from the engine's fan belt system and the field is excited by current from a 12 or 6-v battery as the engine runs at a fast idle. The generator comes with a mounting kit that is adaptable to most late model cars and trucks. Included with the unit is a service outlet and a voltmeter that determines the proper engine speed for the output required. The generator will simultaneously operate a $\frac{1}{2}$ -in. electric drill, 18-in. power chain saw, and a heavy-duty electric soldering iron. It can also power impact wrenches, grinders, and other tools under emergency conditions. The generator permits field repairs at night because one outlet can power tools while the other

continued on page 178



A-W Roller-Compactor delivers vibratory and static weight compaction to 10-in. lift of stone base aggregates.

Austin-Westerns compact deeper, faster by static weight, vibration or both, to meet rigid compaction specifications

Austin-Western's Roller-Compactor combines the advantages of static weight and vibratory compaction to deliver economical precision consolidation of all type materials.

Rolls down, vibrates up

The basic 3-wheel roller unit of the A-W Roller-Compactor works from the top down. Three 240-lb. shoe attachments, vibrating approximately 2200 times per minute, work from the bottom up, filling voids and keying low level material for maximum compaction in fewest number of passes.

This roller-compactor operates at speeds up to 1 mph! Lifts of up to 12 in. of stabilized material can be compacted by successive passes without further costly surface preparation to meet density tests.

A-W 3-wheel rollers are unsurpassed for static compaction of practically all types of roadbuilding materials in lifts of 6 to 8 in. Large diameter smooth-faced steel rollers leave an even, sealed surface. Available in three variable weight models—8 to 11, 10 to 12, and 12 to 14 tons.

To roll a glass-smooth finish on macadam bases and asphalt or in surface smoothing operations, Austin-Western offers four models of tandem rollers. Weights are variable—5 to 8, 8 to 12, and 10 to 14 tons. Portable

tandem model is 3½ to 6 tons.

Rugged dependability

From power unit to final drive, A-W compaction equipment is engineered for precision operation. A-W rollers are famous for rugged dependability, low maintenance.

Other features include hydraulic steering control with motor on or off; many parts interchangeable; oversize axles and antifriction bearings; gas or diesel power; choice of 2 or 4-speed transmission, torque converter standard with 2 speed, optional with 4 speed.

For full information about A-W compaction equipment, see your Austin-Western dealer today or write to us.



A-W Portable Tandem makes finish rolling easy, even up a hill and around a corner while keeping within $\frac{1}{4}$ in. of curb.

Austin 1898-1958
100th YEAR
PARTNERS IN PROGRESS **Western**
CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.
BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes





with MACKS like these PROJECTS GO FASTER. P

TOUGH JOBS? On projects where nothing but the utmost in strength, traction and endurance can handle the work over sustained periods—Macks speed the job with their sure, steady performance.

ROUTINE JOBS? When truck cycle time is crucial for profitable operations, Macks keep all other equipment in constant operation... show the lowest running and upkeep costs of any truck in their class.

UNUSUAL JOBS? Mack can assemble exactly the models you need from interchangeable Mack components—engines, transmissions, frames, axles, etc.—built by Mack in a wide range of sizes.

ANY QUESTIONS? Ask your nearest Mack branch or distributor for the names of Mack users who—like yourself—had to be shown... and were shown. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

ONLY MACKS OFFER YOU ALL THIS:

- Widest range of heavy-duty truck and tractor chassis for construction and road-building—dumpers, concrete mixer models, platform, carry-alls.
- Two, four and six-wheel drive models.

Six-wheel trucks offer exclusive Mack Balanced Bogie with Power Divider—the four-wheel, rear-axle drive that delivers the most engine power to the wheels having traction.

Front-wheel drive models have the greatest traction of any truck in their class... offer exclusive Mack front-wheel driving axle with greatest ground clearance and all parts fully enclosed.

- Wide Mack power options—diesel and gasoline engines—150 h.p. or up to 335 h.p.
- Famous Mack transmissions from 5 to 20-speed, with torque converter option on larger models. Planetary gear reduction in rear-axle wheels of larger vehicles provides smooth power transfer without excessively large gears in the carrier.
- Mack-engineered steering systems, famous for sharp turning angles and easy handling characteristics, that enable Macks to move under shovels faster, maneuver faster, back faster... squeeze in extra trips per shift.
- Rugged, high-tensile frames that give the utmost in structural stamina—heavy-duty axles and suspensions that make light of the heaviest loads over the roughest roadways.
- Many options—including power steering, power brakes, power clutch.

MACK first name for TRUCKS

MACK
ENGINES



MACK B-40 and B-60 SERIES

PAYLOADS: Rear dumper, 5-10 cubic yards; mixer, 5½ to 7½ cubic yards (in six-wheeler models). ENGINES: 150, 170 and 205 h.p.—diesel; 150 and 185 h.p.—gasoline.

MACK B-80 SERIES

PAYLOADS: Rear dumper, 6-12 cubic yards; mixer, 7½ to 8½ cubic yards (in six-wheeler models...larger with special provision). ENGINES: 170, 205, 220 and 320 h.p.—diesel; 232 h.p.—gasoline.



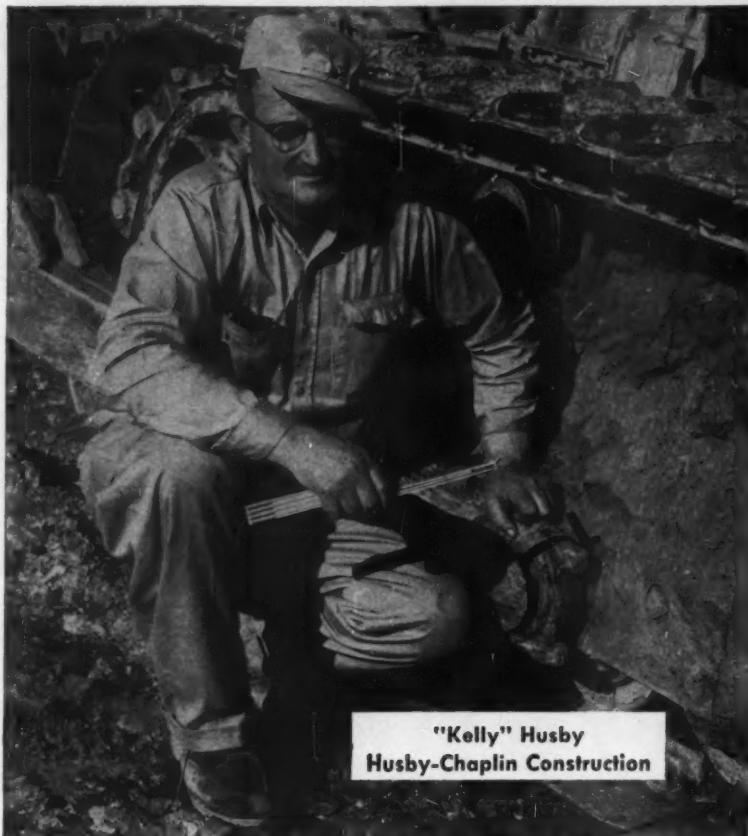
...on the job— ...PROFITS ARE GREATER

MACK MODEL LRX—PAYLOADS: Rear dumper, 15 tons. DIESEL ENGINES: 170, 205 and 220 h.p.



MACK MODEL LVX—PAYLOADS: Rear dumper, 22½ tons. DIESEL ENGINES: 320 and 335 h.p.





"Kelly" Husby
Husby-Chaplin Construction

"Cut track overhaul costs? Sure! We're having our tracks done on a new OTC 'Trackmaster' track press which doesn't broach the pin bosses!"

"We expect about twice as much life out of each set of rails," says Clarence E. "Kelly" Husby, partner in the Husby-Chaplin construction firm in southern Minnesota, "because the OTC 'Trackmaster' hydraulic track press does not ruin the pin bosses, and we can keep rebuilding the rails. And this saves us money! As far as 'downtime' is concerned, there is another saving . . . because we get our tracks done faster, and keep our machines working."

SAVES MONEY IN OVERHAUL

Like contractor "Kelly" Husby, you can save money by having your tracks re-pinned on the new, fast OTC Trackmaster press. Ask your track repair man.



Write for additional information on OTC's
new "Trackmaster" hydraulic track press:

**OWATONNA
TOOL COMPANY**

380 CEDAR STREET OWATONNA, MINNESOTA

EQUIPMENT NEWS... continued

powers flood lights. The generator does not add to the power load while the vehicle is in motion. Power is provided at a flick of a switch. It can be removed quickly from one vehicle and placed in another. The generator and mounting kit are priced at \$137.—**Forney Generators, Inc., Fort Collins, Colo.**



Biggest Ford Loader

Ford's new tractor-loader has $2\frac{1}{2}$ times the lifting capacity of any other Ford unit. Larger and heavier than other Ford general-purpose tractors, the new unit has a 7,000-lb capacity front axle and a new frame design that isolates the driver, engine, hydraulic pumps, and steering system from shocks. Other features include a combination grill and bumper that protect headlights, cooling system, and hydraulic reservoir and pump from damage; full power steering; and a foot throttle that allows the operator to over-ride his hand-set operating speed. Standard engine is a 42-hp gasoline power plant but a diesel is available as optional equipment. The loader is equipped with either a $\frac{5}{8}$ or $\frac{3}{4}$ -yd bucket as standard, and bigger, specialized buckets are available. The loader has a 2,500 lb capacity, 5,500 lb break-away limit, and 11-ft lifting height. Hydraulic power for the loader is supplied by an independently-powered package consisting of an oil reservoir, pump, oil cooler, filter, and control system. The standard model is called the 1821. The 1841 loader has a power take-off, internal hydraulic sys-

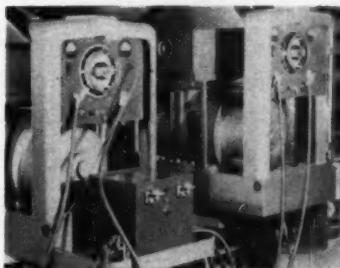


tem, and three-point linkage for rear-mounted equipment. Both feature a four-speed transmission. A shuttle-transmission is available as an option.—Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.



Cuts Pipe Quickly

Wheeler's new hydraulic pipe cutter will cut 4 to 12-in. dia cement-lined iron water mains, 6 to 15-in. soil pipe, 6 to 36-in. terra cotta or clay tile pipe, and 6 to 10 in. transite pressure pipe. The cutter, which requires no vise, can work in a ditch or anywhere else as long as a chain can be positioned. To operate it, the chain is wrapped around the pipe and pulled up through the jaws to the nearest ring. An adjusting screw takes up the slack and hydraulic pressure is applied by a hand or electric pump. A clean, accurate cut can be made in less than 1 min. With enough chain to cut 12-in. pipe, the unit sells for \$352.50. — Wheeler Mfg. Corp., Ross Rd., Ashtabula, Ohio.



Offers Power Choice

Hobart's new heavy duty arc and stud welder is available with either a gasoline or diesel engine power source. The dc welder is rated at 600 amp, 40 v on 60% duty cycle. Welding current range is 70 to 800 amp and 1 kw of 110-v dc auxiliary power is available while welding. The gasoline power plant is a Chrysler engine with 354 cu in. displacement and the diesel is a General Motors unit with 212.8 cu in. dis-

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This new Renner heavy duty dipper is designed to outperform under a great variety of job requirements and conditions. It weighs 1900 lbs. and is of high alloy, high carbon cast weld construction. Cost is comparable to standard bucket prices.

The dipper fits any make machine and can be had with drop forged teeth or, at a slight extra cost, with the newly designed Renner two piece shank-and-cap teeth that give longer maintenance-free service.

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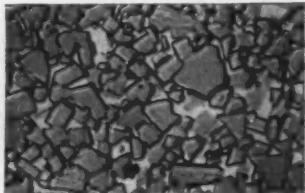
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Longer bit life— with new Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities—therefore stronger, longer-lived.

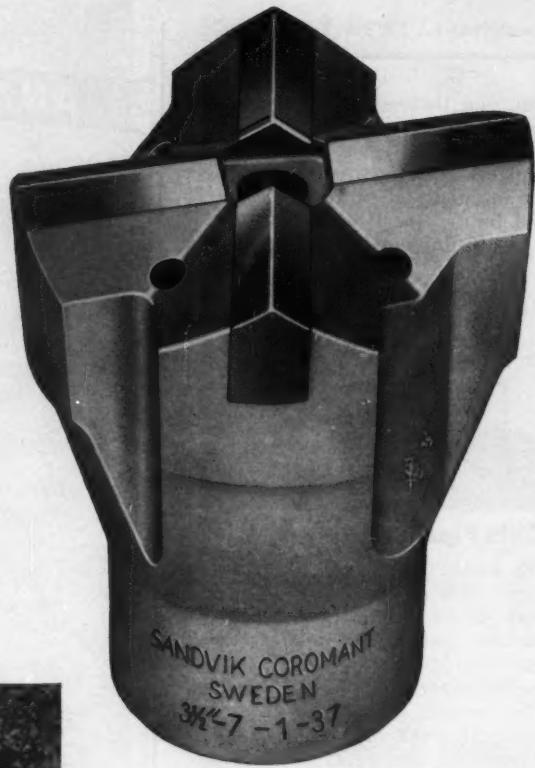


Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Available Diameters, in Inches

Type	Thread	1/4	1/8	1/2	1/3	1/4	1/5	2	2 1/8	2 1/2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5
S	TAPER	x	x	x	x												
HO	F		x	x													
U	113	x															
D	H		x	x	x	x	x	x									
U	115		x	x													
D	D			x	x	x	x	x	x	x	x	x	x	x	x	x	
K	K												x	x	x	x	x
B	1" Rope		x	x	x	x		x									
OT	1 1/4" Rope			x	x	x	x	x	x	x							
M	400			x	x		x	x									
IN	1 1/2" Rope					x	x	x	x	x	x	x	x	x	x	x	x
G	600						x	x	x	x	x	x	x	x	x	x	x
B	700							x	x								
O	J7.5								x	x							
T	2" Rope								x	x	x	x	x	x	x	x	x
IN	1000									x							



NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used—as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels—the most widely used in the world—and Sandvik Coromant extension steel equipment.

Write or phone today for further details to either of the addresses below:

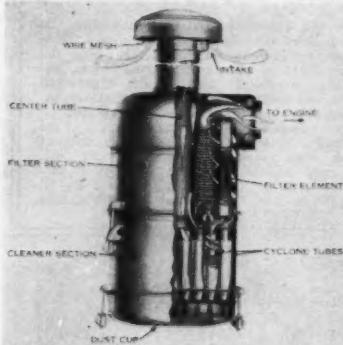
610 Industrial Avenue
Paramus, New Jersey
Colfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

EQUIPMENT NEWS... continued

placement. Also available from Hobart is a new attachment that simplifies the paralleling of two arc welders so that their combined capacity can be used for such jobs as automatic welding, arc cutting, and stud welding. It provides protection to the welding units if either machine is adjusted improperly or fails to perform correctly. Enclosed in a 13x16x15-in. steel case, it consists of a magnetic contactor controlled by a push button and a protective current relay. A light indicates when the contactor closes. Should the two welders become badly unbalanced, current will flow in the equalizer circuit and trip the protective relay. This trips the contactor. Shown mounted in front of the new 600-amp welder on the left, the unit can be used with any Hobart electric, gasoline, or diesel-powered rotating type dc welder that is rated at 60% duty cycle or higher.—Hobart Brothers Co., Troy, Ohio.



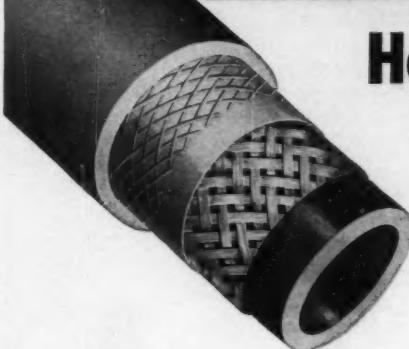
Cat Has Dry Cleaners

A dry-type Donaldson air cleaner, said to be 99.8% efficient, is now available for use on Cat DW20 and DW21 tractors. A disposable cellulose filter, multi-cyclone pre-cleaner, aluminum center tube, housing, and collecting tray make up the cleaner unit. During operation, air is drawn through the stack cap, passes down through the aluminum center tube, and enters the multi-cyclone pre-cleaner. The pre-cleaner is made up of two aluminum spirals and a group of vertical, funnel-shaped nylon tubes. As air enters the spirals it swirls, setting up a centrifugal action that pulls out dirt particles. Air then travels upward through aluminum tubes to the resin impregnated cellulose filter element.



Approximately 40 sections of Thermoid Powerflex Hose, ranging from 15" to 12' in length, and from $\frac{3}{4}$ " to $1\frac{1}{2}$ " in diameter are used on this Oliver Super 88 Diesel Tractor equipped with a Ware Hydra-Trencher.

Hose that's built to take it!



Cut costs with
Thermoid Conveyor Belts



... and Thermoid Multi-V Belts



On a recent sewer installation, Lehigh Foundation, Inc., Dresher, Pa., dug 40,000 feet of trench. According to Mr. Douglas Sammak, President: "We dug this trench eight hours a day, five days a week on hard ground conditions, and we have over 2,000 hours registered on the machine. The Thermoid Powerflex Hose stood up under terrific punishment on this job."

Take a leaf from Mr. Sammak's book. You, too, will find that using Thermoid Powerflex Hose helps you keep maintenance costs and downtime to a minimum... your operations moving on schedule.

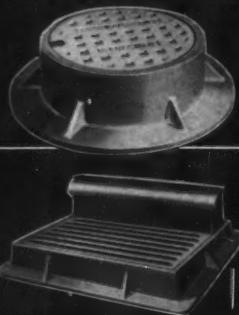
Your local Thermoid Distributor can help you select the hose best suited to your needs. If you prefer write direct to: H. K. Porter Company, Inc., Thermoid Division, Philadelphia 35, Pa.

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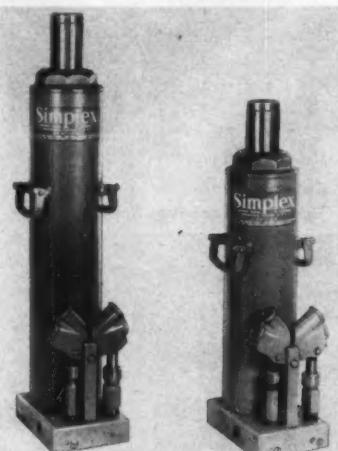
EQUIPMENT NEWS... continued

and this removes the remainder of the dirt. Clean air is directed into the intake manifold to the diesel engine. The dry-type air cleaner reduces maintenance costs. Under most conditions, the collection cup requires servicing once a day and the dry-type element is removed and cleaned or discarded at engine oil change periods.—**Caterpillar Tractor Co., Peoria, Ill.**



Finishing Screed

Two new Thor vibratory screeds are designed for rapid finishing of prestressed concrete in conventional channel, double-tee, and other precast sections. An electric motor actuates a series of steel straps between the two beams. This causes a slapping action that forces water and air out and produces a dense, hard-surfaced concrete. Model FSM-4 is 4 ft long, and Model FSM-6 is 6 ft long.—**Thor Power Tool Co., 175 N. State St., Aurora, Ill.**



New 25-ton Jacks

Two new 25-ton hydraulic jacks have been added to the Simplex line by Templeton, Kenly & Co. Both are equipped with high and low-speed pumps that can be operated singly or in unison. One model, called the 25H28, has a



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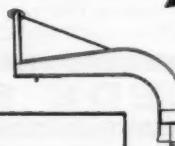
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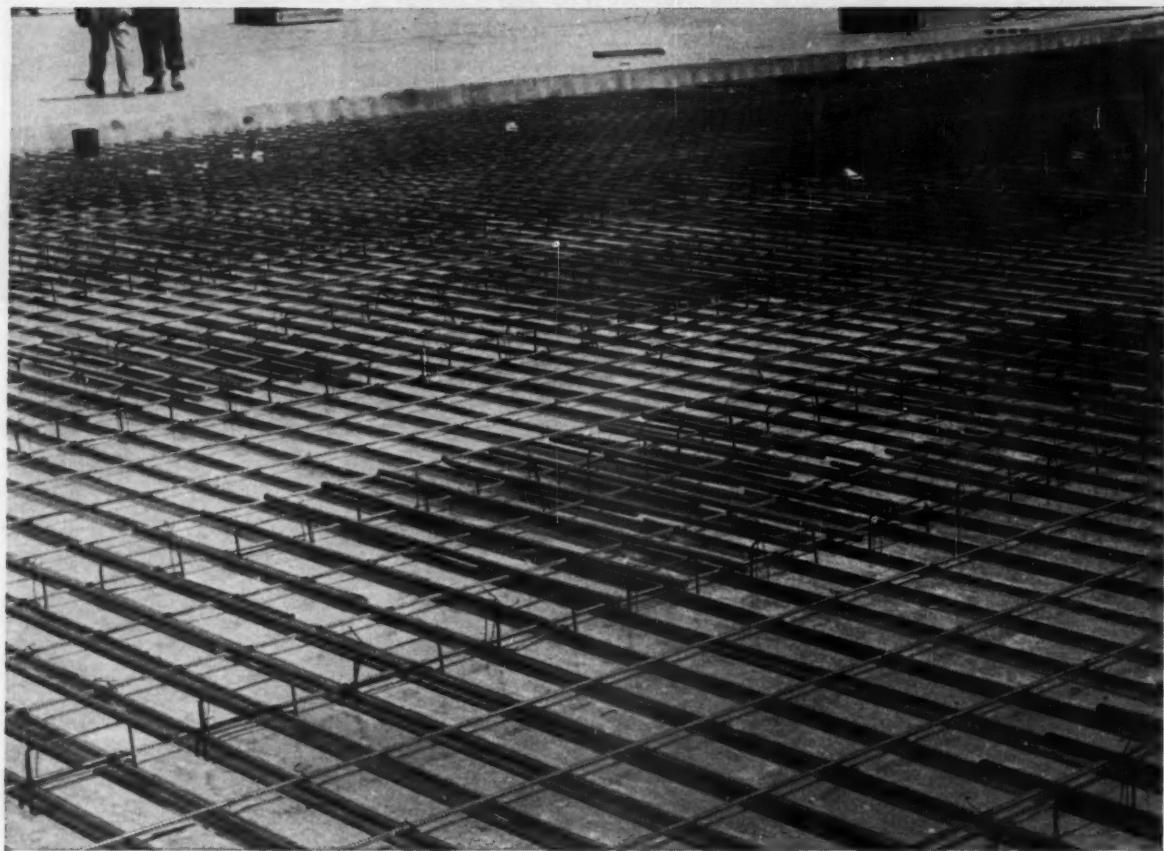
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LACLEDE PREFABRICATED SLAB REINFORCEMENT SAVES 100,000 TIES IN NEW PLANT CONSTRUCTION

Laclede multi-rib round reinforcing bars shop welded into special prefabricated units saved hours of costly time in the construction of floor slabs for Chrysler Corporation's new St. Louis Assembly Plant. Eighty-seven thousand of these top and bottom steel reinforcing units, each consisting of two bars up to 15' long welded to supporting frames, were used in the construction of 485,000 square feet of flooring.

Fabricated to extremely accurate dimensions, units were easily handled and dropped into place on the metal deck. Approximately 100,000 ties were saved by the use of these special Laclede-designed units.



LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI

CHRYSLER CORPORATION ST. LOUIS ASSEMBLY PLANT

St. Louis County, Mo.

General Contractor: H. D. Tousley Co., Inc., Indianapolis

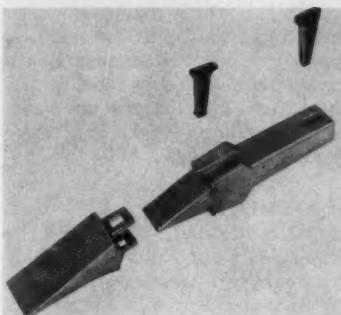
Architect: Albert Kahn,

Associated Architects and Engineers of Detroit



Producers of Steel for Industry and Construction

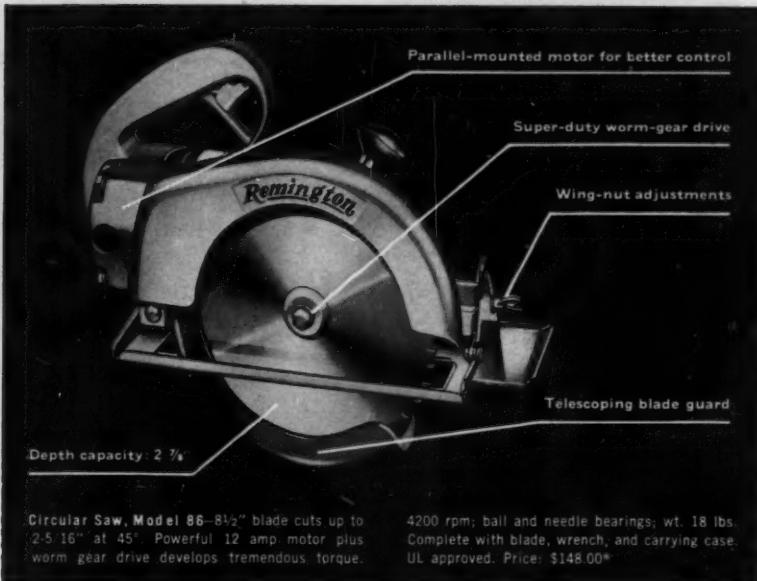
closed height of 22 in. and a 16-in. lift. This jack weighs 105 lb. Both models can lift 50% more than their 25-ton rated capacity, according to the manufacturer. They can operate in either a vertical or horizontal position and they are equipped with double lever sockets.—Templeton, Kenly & Co., Broadview, Ill.



Quick-Change Teeth

Renner's new two-piece shovel dipper tooth consists of a high-carbon alloy steel point that is locked in place on a rugged shank by a spring-type pin. When replacement is necessary, the job is quickly accomplished by knocking out the easily accessible pin. Another feature is the curved design of the lower surface of the tooth. This keeps the point sharp while it wears so that it maintains its original penetrating ability for long periods. Shanks to fit all Renner shovel dippers as well as other makes are available. The two-piece teeth also are available on Renner's new $\frac{3}{4}$ -yd heavy-duty dipper (bottom photo). Drop-forged teeth are standard. The new cast and welded dipper, which can be adapted to any make of excavator, weighs 1,900 lb.—Renner Mfg. Co., 4810 N. 124 St., Milwaukee 18, Wisc.

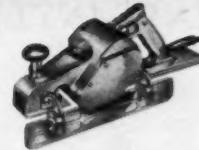
POWER to boost job efficiency with REMINGTON tools



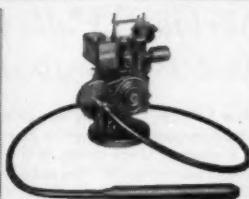
Power Trowel, Model TG4-28—2½-hp, 4-cycle, gasoline-powered engine; 26" ring size; automatic recoil starter; centrifugal clutch disengages at idle. Price \$340.00.



Electric Drill, Model 125—½" capacity; 7-amp motor, most powerful in its class; 500 rpm; rugged construction yet light weight: 8½ lbs. Price \$73.00*



Plane, Model 3P—Extra-heavy-duty, 3" combination door and surface plane—converts by removing fence; superb balance; 8.4-amp motor. Price: \$170.00*



Concrete Vibrator 10GVR has 5-hp, air-cooled, variable-speed gas engine—up to 3,200 rpm. Economical. Up to 10,000 v.p.m. Price from \$414.00.



Electric Chain Saw, Model 11E120—12-amp universal motor; hardened steel bevel gears; 12" bar with Roller Bearing nose; Wt. 18 lbs. Price \$120.00*

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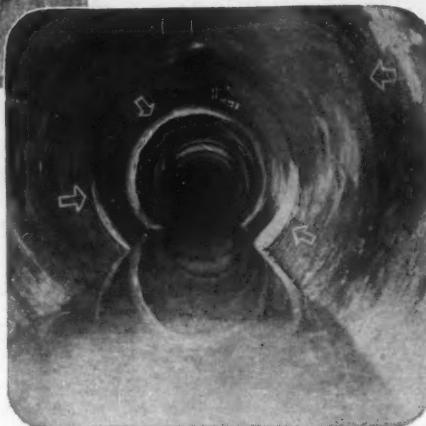
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Waterplug stops running water INSTANTLY!



AFTER

Here is what Underwater Services, Valley Station, Ky. had to say about Waterplug

On October 6, 1957, our Underwater Services Company was called upon to repair a major break in an underwater drainage system for the Hardin County Sportsmen's Lake at Elizabethtown, Kentucky. Upon diving to the bottom of the lake we discovered several large ruptures in the 24" tiles used in the drainage system. Water, uncontrolled, was pouring through these breaks at a minimum approximate rate of 20 gallons per minute. Using underwater diving equipment we managed to reduce this torrent by packing sandbags into the holes channeled through the four feet of earth covering these tiles. Descending through a water control tower, we gained access to the interior of the drainage tiles to the area of break-through. Above us were four feet of lake bottom and 20 feet of water above that. Under these extremely adverse conditions we used the Thoro System WATERPLUG Cement to repair the breaks from the interior of the tiles.

Because of the simplicity and ease of mixing and applying WATERPLUG Cement, we were able to completely and effectively repair these breaks in the drainage system.

We were delighted with the effectiveness of WATERPLUG Cement in successfully overcoming this difficult water repair problem. Feel confident that in future underwater repair problems, our company will rely upon WATERPLUG Cement.

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New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

WIRE ROPE—A 190-p catalog, the G-16 Blue Book of Wire Rope, contains considerable basic information on all phases of wire rope usage, including definitions, descriptions, diagrams of various types of rope, and suggestions on the proper use of wire rope. Available from distributors or direct from company.—**Macwhyte Wire Rope Co.**, Kenosha, Wis.

SCAFFOLDING—An 8-p catalog, No. CF-201, describes the Superior line of Auto-Lock tubular steel scaffolds. Dozens of tips are included to help contractors achieve the most economical solutions to a variety of problems such as bracing for height, scaffolding flat, sloping and curved ceilings, how to cut costs on exterior scaffolds and shoring installations. — **Superior Scaffold Co.**, 5624 Bankfield Ave., Culver City, Calif.

GRADERS AND ROLLERS—A new booklet, No. HWG-561, describes the complete line of Huber-Warco motor graders and road rollers. Included are details of nine motor grader models ranging from 75 to 195 hp, tandem and 3-wheel rollers, and the M-52 Maintainer that performs nine maintenance jobs.—**Huber-Warco Co.**, Marion, Ohio.

LOADERS—Three booklets by Ottawa Steel describe three of their loaders. Form LXCH-1-58 covers a truck-mounted backhoe for Chevrolet trucks. This rig is mounted on a regular truck for fast travel, digs 12½ ft deep in any position of a 190 deg arc, and can be readily mounted or removed from the truck. Two booklets, LX-1-15M-458 and UL-1-10M-458 respectively describe the LX backhoe and the model U front-end loader designed to work together on many models of tractors.—**Ottawa Steel Division, Young Spring & Wire Corp.**, Ottawa, Kansas.

continued on page 189



**contractors
wanted it...**

**INSLEY
produced it!**

TYPE



15 ton crawler crane

3/4 cu. yd. excavator

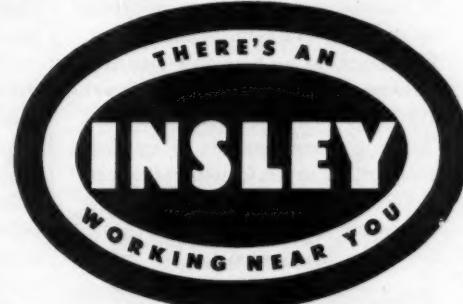
20 ton truck crane

DESIGNED WITH YOUR JOB IN MIND...

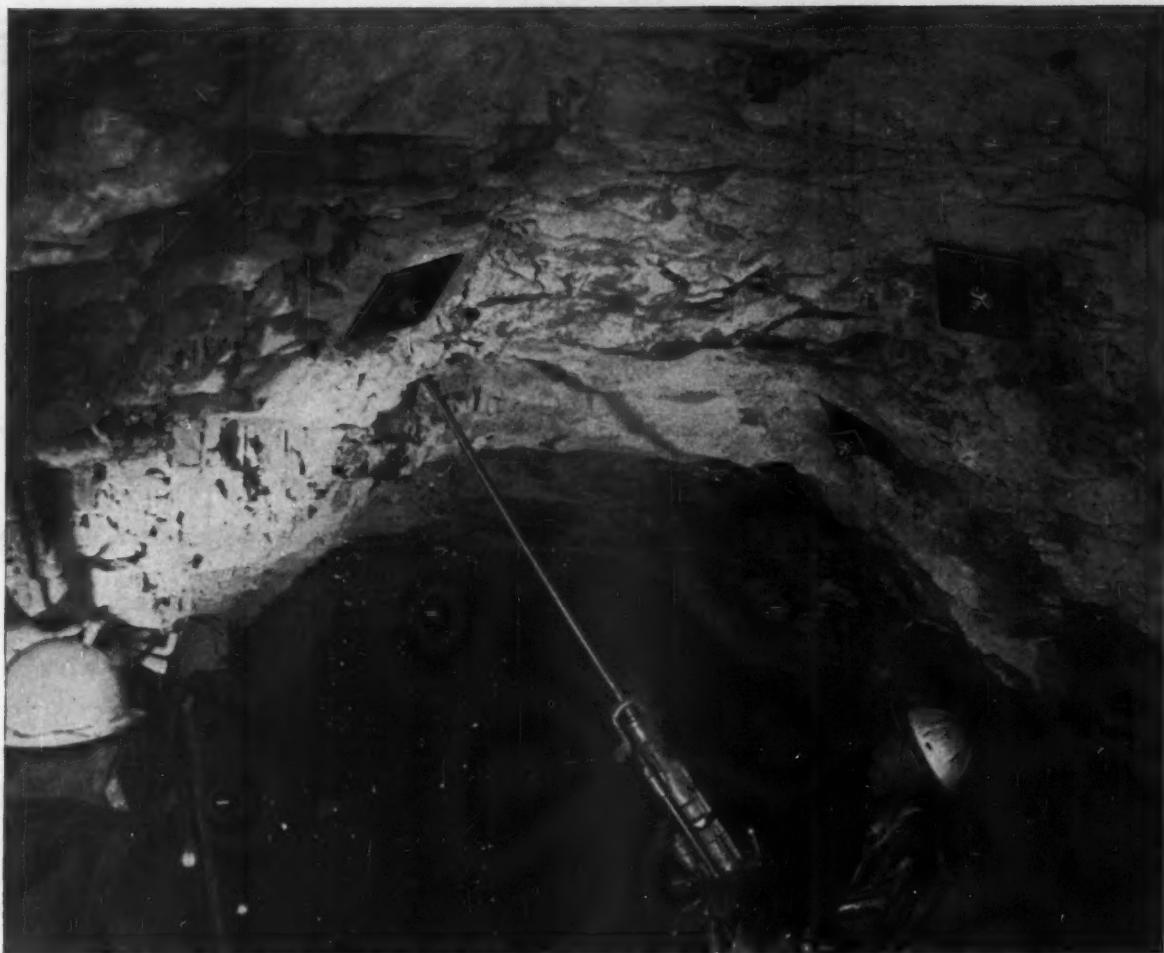
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- Large diameter turntable with internal bull gear.
- Anti-friction bearings, aluminum bronze bearings and involute shaft splining.
- Wide, deep design crawler carbody
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Installing Bethlehem rock bolts in tunnel roof. General Contractors and Engineers: James McHugh Construction Co.

Wedge-Type Bolts Support Roof of Buffalo Sewer Tunnel

A new storm relief sewer in Buffalo, N. Y., provides additional protection for property in a semi-business area. The horseshoe-shaped tunnel, authorized by the Buffalo Sewer Authority, was bored through solid Onondaga limestone. It is approximately 9 ft in diameter, and about 6800 ft long. Bethlehem slotted rock bolts were used in the tunnel roof, to provide firm support.

BOLTS LOCK ROCK SLABS TIGHTLY

Bethlehem rock bolts are ideal for supporting tunnel roofs because they

lock together stratified rock slabs. They are strong, easy to install, and provide an extra margin of safety.

The 1-in. diam slotted bolts, threaded at one end, have a forged slot at the opposite end, which accommodates a steel wedge. The bolts are inserted wedge-first into drilled holes. When the back of the hole is reached, the wedge drives deep, spreading the bolt ends so that they anchor in the hole.

Bethlehem also produces $\frac{5}{8}$ -in. and $\frac{3}{4}$ -in. diam headed rock bolts, used with an expansion shell and a

steel plug. When this bolt is tightened, the plug is drawn down on the threads, expanding the serrated leaves of the shell.

If you have any question about the use of Bethlehem rock bolts, or rock bolt accessories, all you need do is get in touch with the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

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This versatile piece of equipment can readily be converted to a "Pea Shooter" for shooting Peg or "Bird's Eye" gravel back of liner plates and back-packing outside lagging plates.

Write for Free Catalog 13 for full details and specifications.



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1½, 3 and 6 Tons



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- Weights:

1½-ton, 23½ lbs.
3-ton, 36½ lbs.
6-ton, 63 lbs.



ACCO

Write to York, Pa., office for complete information



Wright Hoist Division
AMERICAN CHAIN & CABLE

York, Pa., Bridgeport, Conn.

NEW PUBLICATIONS . . .
continued

LOADER—The 42-p Case Utility model 310B wheel-mounted backhoe-loader is described and illustrated in an 8-p bulletin No. CUS-110. The booklet presents 35 operating advantages of the machine plus pertinent mechanical details of the Case-built backhoe, loader, and heavy-duty tractor. Action views of the rig working under various conditions are included.—J. I. Case Co., Racine, Wis.

ELECTRODES—Bulletin 7000.2 is a 20-p catalog and procedure guide for Lincoln manual arc welding electrodes for hard-surfacing and welding stainless steels, non-ferrous metals and cast iron. The Weldirectory describes each electrode, its properties, and applications. Charts aid electrode selection and give welding machine settings for each electrode.—The Lincoln Electric Company, Cleveland 17, Ohio.

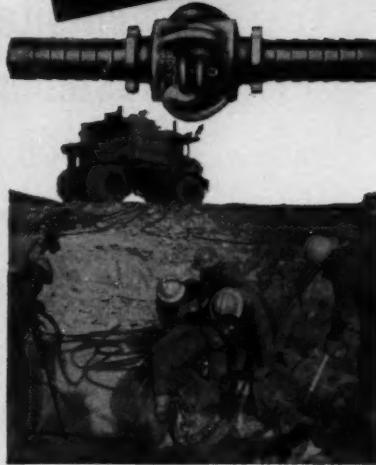
COMPACTION EQUIPMENT—A 16-p pamphlet covers various types of compaction equipment in use today, including rollers and vibratory compactors. It deals with fundamental problems encountered in the efficient compaction of various materials and the correct application of the many types of equipment available. An extensive glossary on the subject is included.—The Galion Iron Works & Mfg. Co., Galion, Ohio.

HARDHATS—Highly resistant to impact and penetration and now available in nine colors for quick personnel identification are Skullgard hats and caps that are described in a new brochure. The new color finish is a chip-proof epoxy paint chemically bonded to the shell.—Form 0601-4, Mine Safety Appliances Co., Pittsburgh.

ELECTRIC PLANTS—A 4-p folder tells how to select an electric generating plant and shows pictures of Onan plants at work. Factors listed are number of power tools being used, size of work crew, portability, and maintenance. Specifications and optional accessories for each Onan model from 500 to 10,000 watts are given.—Folder F-123, D. W. Onan & Sons Inc., Minneapolis 14, Minn.

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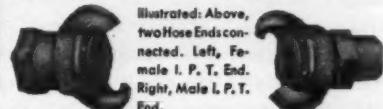
Quick Action and
Tight, Pressure -
Proof Connections



"AIR KING"
Quick-Acting, Universal
HOSE COUPLING

FOR COMPRESSORS, ALL TYPES
OF AIR TOOLS, WATER, OIL
AND SPRAY SERVICE

This versatile coupling is built along plain, rugged lines to assure long, trouble-free service under severest working conditions.



Illustrated: Above,
two Hose Ends con-
nected. Left, Fe-
male I. P. T. End.
Right, Male I. P. T.
End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

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"on-site"
fastening
service



Only Ramset offers the exclusive "plus" of complete on-the-job fastening service for contractors. Complete Ramset training on the proper use of powder actuated fasteners and tools covers most construction needs. But, if and when special problems come up on selection of fasteners or fastening "know-how", Ramset experts will come right to the job site with the correct answers.

"On-site" service is another Ramset exclusive which has made this powder-actuated system the best known and most widely-used in all phases of construction.

For the name of your Ramset dealer look under "Tools" in the Yellow Pages, or write direct for further information.

In addition to powder-actuated fastening, the versatile Ramset System includes Shure-Set hammer-in tools for light fastening, and Ringblaster heavy-duty kiln gun.

Ramset Fastening System

WINCHESTER-WESTERN DIVISION • OLIN-MATHIESON CHEMICAL CORPORATION
BEREA ROAD • CLEVELAND, OHIO

NEW PUBLICATIONS . . .

continued

COMPRESSOR—A 4-p bulletin describes the new Le Roi 365 rotary air compressor. The bulletin number is P-121B. The manufacturer claims that this is the slowest running (1100 rpm) 365 cfm rig on the market. The bulletin includes general specifications.—**Sales Promotion Department, Le Roi Division, Westinghouse Air Brake Co., Milwaukee.**

BUYERS' GUIDE—The Committee of Stainless Steel Producers of the American Iron and Steel Institute has just published a new reference manual entitled "Buyers' Guide for Stainless Steel Products and Services." The 159-p book lists 3,000 firms that make products of stainless steel or offer services pertaining to stainless steel. Also included is a special table giving names and addresses of mill suppliers and the forms and shapes that they produce.—**The Committee of Stainless Steel Producers, American Iron and Steel Institute, 150 East 42nd St., New York 17, N. Y.**

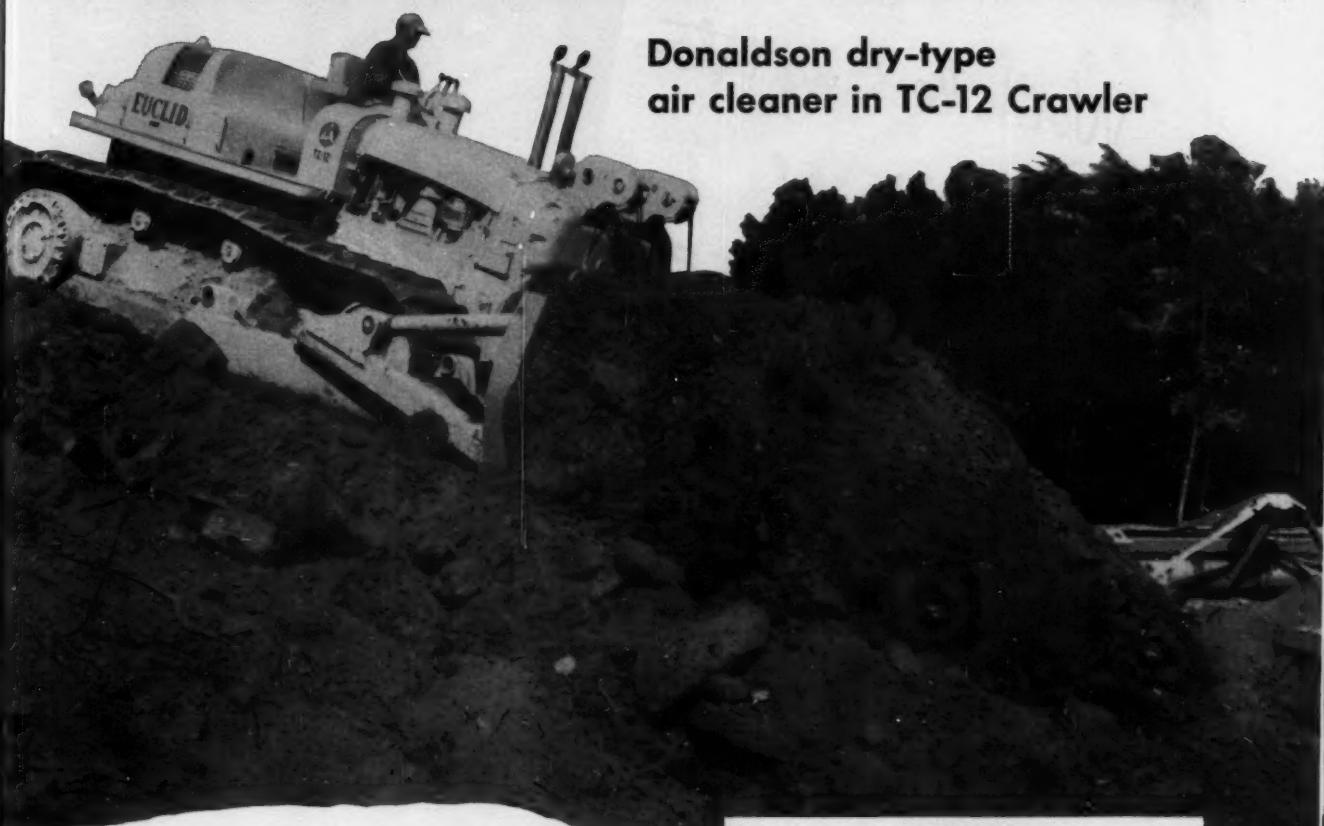
PLYWOOD FORMS—A catalog on PlyGlaze overlaid plywood concrete forms describes performance on jobs requiring smooth architectural concrete and cost cutting potential in forms designed for 25 or more reuses. Included is information on costs, sizes, specifications, and source of supply.—**St. Paul & Tacoma Lumber Co., Tacoma, Wash.**

GANG VIBRATION—A bulletin on deep slab internal gang vibration gives complete information on the Stow BUSP electric vibrators, mounting frames, brackets, and generators. The bulletin has job illustrations of the assembly with 10 vibrators for a 25-ft width slab on an airport runway. Complete information is given for selecting the right combination of components for any width of slab.—**Bulletin No. 5820, Stow Mfg. Co., 31 Shear St., Binghamton, N. Y.**

TRANSMISSIONS—Form 114 is a 10-p booklet covering the complete line of single-stick, semi-automatic Fuller RoadRanger transmissions for both on-highway and off-highway service.—**Fuller Manufacturing Co., Kalamazoo, Mich.**

Another EUCLID product improvement!

Donaldson dry-type
air cleaner in TC-12 Crawler

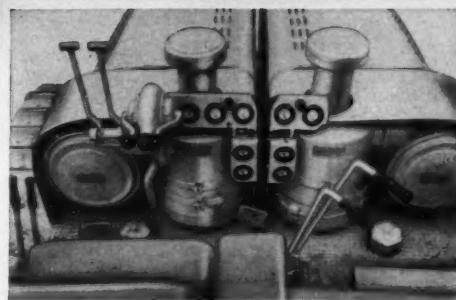


One of the reasons the new series Euclid TC-12 Crawler provides more work-ability with less down-time is the unequalled accessibility of all major components for quick, easy servicing.

As shown in the photograph, the two Donaldson dry-type air cleaners, one for each engine, are conveniently located for easy access. Both pre-cleaner and secondary filter can be serviced in a fraction of the time required for oil bath cleaners and there's no mess—just empty the pre-cleaner dust cup, clean and replace a paper element in the secondary cleaner.

HIGH EFFICIENCY CLEANER INCREASES ENGINE LIFE

The Euclid TC-12 Crawler is now being built with the Donaclone dry-type air cleaner as standard equipment. This 99.9% efficient cleaner reduces engine wear caused by dust—increases the service life of the engine and helps maintain top operating efficiency. Engine manufacturers say that 8 ounces of



abrasive dust can ruin an engine in a short time. Because of the tremendous volume of air that passes through an engine in a single shift, the importance of air cleaner efficiency is obvious. That's why Euclid uses this Donaldson cleaner on the new series TC-12... it's another example of constant product improvement that makes Euclid your best investment.

EUCLID Division of General Motors, Cleveland 17, Ohio



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FOR MOVING EARTH, ROCK, COAL AND ORE

Worth looking into—
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HOMELITE
3000 WATT
GENERATOR



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We put it squarely up to builders and contractors all over the country. Homelite engineers wanted to know what you need in a lightweight gasoline engine driven generator. And here's the Homelite solution . . . a brand-new unit that weighs only 140 pounds and gives you full 3000 watts. It has the extra power to run extra tools and floodlights. And you don't have to operate rheostats or other

controls. The voltage is automatically controlled within four per cent from no load to full load. This new Homelite model 8A is completely free from trouble makers. No DC brushes. No commutator. No DC windings on armature. See it in action, right away. Two models are available . . . 115 volt and 115/230 volt, both 60 cycle, AC.

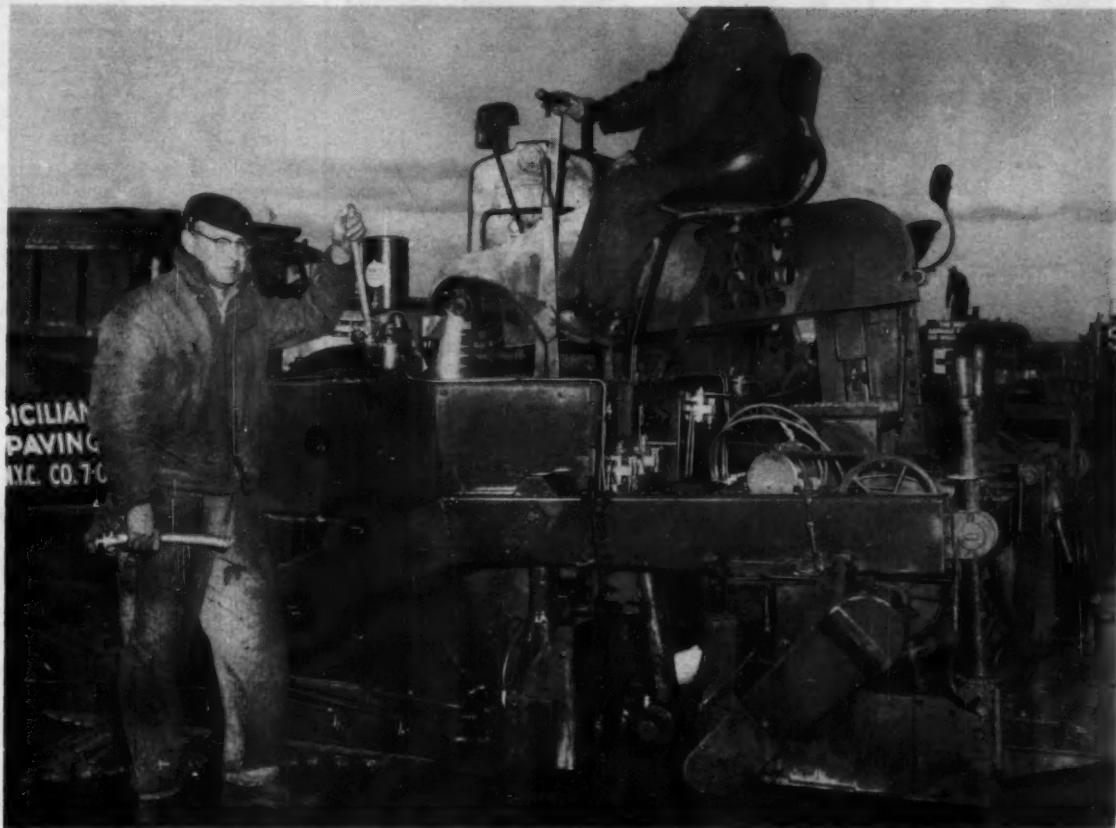
Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

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BLOWERS



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In Canada — Terry Machinery Co., Ltd.

The Maintenance Shop...



Centralized Lubrication Gets Test on Finisher

All but four of the 108 grease points on Barber-Greene bituminous finisher are serviced at recommended intervals from a centralized lubrication system.

CENTRALIZED LUBRICATION is undergoing one of its biggest tests on a bituminous finisher that has been fitted with a central grease system.

The lubrication system on the Barber-Greene 879B finisher covers all but four of the rig's 108 grease points. Installation was a tough problem because of the machine's many moving parts.

The machine's owner, Joseph J. Haggerty, Sr., president of the Sicilian Asphalt Co. of Brooklyn, N. Y., expects the system to pay big dividends.

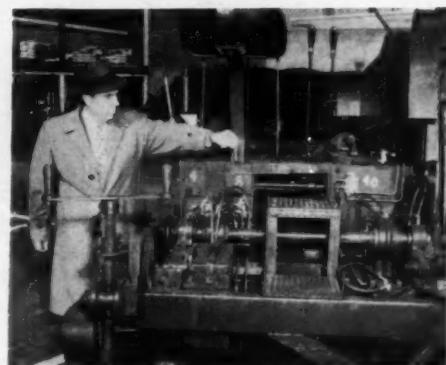
"Unless this machine gets on-time lubrication, we can suffer a lot of expensive down-time," he says. "The entire cost of installing

the system easily can be exceeded by two or three failures caused by someone forgetting to lubricate a few points at the correct intervals. We also are saving the time formerly required for manual lubrication and we anticipate that we will waste less grease."

The Barber-Greene finisher was fitted with an Accumatic No. 2 centralized lubrication system by the Alemite Co. of Long Island City, N. Y. There are actually three "systems" on the finisher, all supplied from the same manually operated Alemite reservoir pump. One system serves all points requiring lubrication at 4-hr intervals; another takes care

continued on page 196

QUICK SERVICE—Operator actuates pump until signal device tells him that all grease points have been serviced properly. The entire operation takes only 90 sec.



WORK TOGETHER—Each of three main lube lines—for 4, 8, and 40-hr intervals—has its own admitting valve. Lines are serviced individually or simultaneously.

Tuffy® Wire Rope Tips

Guard Against These Killers!

...Get The Full Measure of
Service-Life Built In By Wire
Rope Specialists



Tuffy Balanced Scraper Rope

"Balanced" construction makes it flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Also gives higher resistance to the shock of load impact on slack line. Moves more yardage per foot because it's specially built to take the beating of drum-crushing abuse.



Mangled in a Wedge Socket



Here's a result of improper socketing. It was caused by using a poorly designed or worn-out wedge socket. Failure at the dead end can damage other sections of the rope, too.

Rusty Road to Ruin



Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. An insidious, silent type of killer, rust often does irreparable damage before it's even noticed. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that, with other conditions ideal, properly lubricated rope has up to 10 times the life expectancy of dry rope.

Overloaded — Soon Exploded

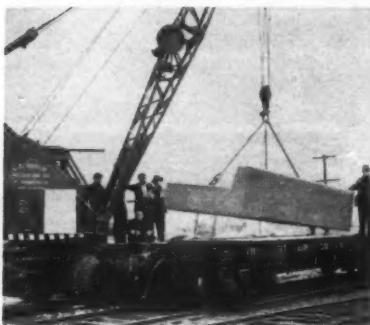


The rated capacity of a wire rope is based on the breaking strength (catalog) divided by a safety factor applicable to the type of service or use. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or costly and dangerous early failures are likely to occur.

Victim of the Bends



Excessive bending of wire rope accelerates wear. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union Wire Rope engineers have compiled data that you can use to assure getting the rope construction that will give you the longest service life. Ask about it.

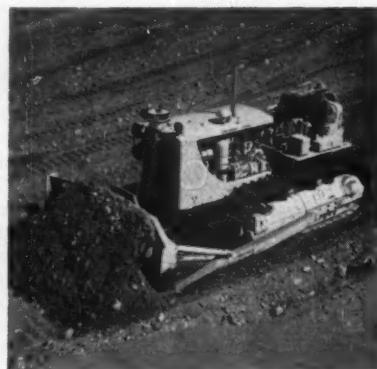


Tuffy Balanced Slings & Hoist Lines

"Balanced" because they combine strength, flexibility and toughness in the proper relationship to do a better job longer.

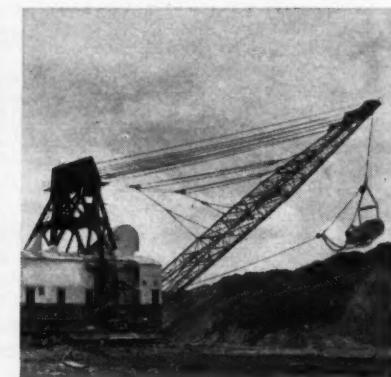


Tuffy Slings and Hoist Lines are a top-performing team, in every type of materials handling. The slings are made of a patented, machine-braided fabric that's next to impossible to knot or kink. The hoist lines are a special construction in which strength, flexibility and toughness are balanced.



Tuffy Balanced Dozer Rope

Built to give you longer service with less downtime. Mounted on your dozer, a 150' reel of $1/2"$ or $9/16"$ can give you a big bonus of extra service. Here's how: when rope shows drum wear or is crushed on the drum, you feed through just enough to replace the damaged part. You save the 40 to 50 feet ordinarily thrown away. Also available in 300' and 500' reels.

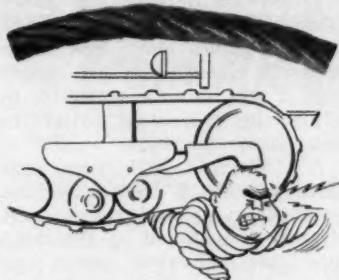


Tuffy Balanced Dragline Rope

Here's highest abrasive resistance with super flexibility. Better spooling. Smoother riding on grooves. And Tuffy Dragline Rope hugs the drum when casting for full load. Gives you longer service life, consistent dependability, in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.



Crushed by a Tractor Cleat



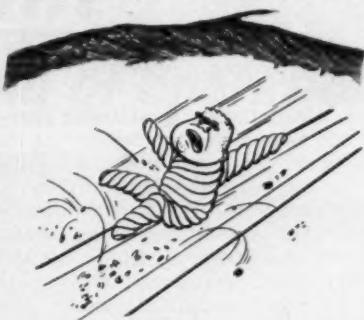
The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mis-treatment.

After a Suicide Jump



This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

Burned on a Frozen Sheave



End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

"Real Gone" From Beatings on the Drum



Even under normal operating conditions, drum wear gives wire rope severe punishment. This wear concentrates at the cross-over points and at the flange. Excessive drum crushing results from operating on small drums, excessive loading and poor winding. Smooth drums are not recommended. Here are typical "drum beatings": Cross-over wear; cross-over crushing on drum; drum

crushing from poor winding; drum-crushing from small drum.

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line by improving drum conditions. Union Wire Rope Engineers will help you with this problem. Get in touch with us for information.

On the "Blink" from a Kink



This open kink resulted from mis-handling of rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller. Always enlarge it, then straighten out the rope.

Strangled by a Misfit Sheave



When the bearing surface of a sheave is too small for the rope diameter, pinching action quickly destroys the rope—especially when it's over-loaded. The victim shown here was knocked out in just 1½ hours of service.

Tuffy Wire Ropes are "Job Prescribed"—Each Designed for a Particular Type of Machine

There are thousands of wire rope constructions and Union Wire Rope specialists make them all. But, there is only one Tuffy line of wire ropes. Each Tuffy was developed and proved the one best rope for the particular work for which it is intended. It is designed as a functional part of the type of machine on which it is used.

Tuffy Wire Ropes are "job prescribed" and balanced in each prescription are all the ingredients of strength, flexibility and toughness to give you genuine relief from inefficient operation, foreshortened service life and safety hazards. You get longer service life and you cut down on your rope costs. Union Wire Rope Corporation, 2270 Manchester Avenue, Kansas City 26, Missouri.

Your Tuffy Distributor Can Help You Get The Full Measure of Service Life

UNION



WireRope



Subsidiary of ARMCO STEEL CORPORATION

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of 8-hr lubrication points; and the other system lubricates 40-hr points.

Using the Barber-Greene service manual for the finisher as its guide, the Alemite Co. led lines to all but four of the finisher's grease points. The four points excluded were fittings on the eccentric shaft bearings. These are 40-hr points that must be serviced by hand once each week. The centralized system also does not

provide engine oil or gear oil for transmissions and gear boxes.

The only change from the lubrication recommendations in the Barber-Greene manual is that a few 8-hr points are lubricated every 4 hr. This is because they were more accessible to the lines of the 4-hr system.

It was possible to make this change without flooding the 8-hr grease points because every one of the 104 lubrication points cov-

ered by the centralized system has its own discharge valve that is adjusted to deliver the exact amount of grease required. As the finisher grows older and more grease is needed for, say, bearings, it will be an easy matter to adjust the individual outlets to compensate for wear.

All 104 grease fittings are supplied with No. 2 general purpose grease from a central reservoir. A strainer is installed on the main lube lines, and valves cannot pass foreign matter into grease fittings.

To lubricate the finisher, the operator merely turns an admitting valve handle to the line to be greased. Then he actuates the pump until a signalling device on the valve shows him that the line has been serviced properly. The entire operation takes about 90 sec. If necessary, the operator can service 4, 8, and 40-hr points simultaneously.

On Sicilian's machine, the 4-hr points are serviced each morning at the start of work and again after lunch time. The 8-hr points are lubricated at the same time the 4-hr morning shot is given to the finisher. The 40-hr points are usually lubricated at the end of the week so that the machine will stand over the week-end with a fresh supply of grease in the bearings. Monday morning always finds the rig ready for work.

The factors that make the finisher such a big test of centralized lubrication on construction equipment are that there are a large number of moving parts on the machine and that the vibration problem is a serious one. These problems required the installation of neoprene hose lines to reach many of the grease fittings. To avoid corrosion, copper tubing is used except where the flexibility of hose is required. There is no steel tubing in the system.

Another advantage of copper tubing is that it is easier to bend and form than steel tubing. This was important because of the many small bends that had to be made to reach out-of-the-way lubrication points.

The centralized lubrication system on the Sicilian finisher was installed by Alemite personnel. However, Alemite also is making available a kit that includes the pump, reservoir, valves, and tubing, along with detailed instructions, so that the system can be installed on other finishers by contractors.

ROCKFORD



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Insure SMOOTH Powerful Pick-Up in Heaviest Going

Compared to previous type clutch facings, Morlife® Clutch facings reduce foot pedal pressure up to 50%. They assure positive engagement—with power-holding grip. Provide a degree of heat resistance and dissipation never before available. They give several times the durability for prolonging clutch life and extend the time between pedal adjustments many times as long. Let ROCKFORD clutch engineers show you how these new advantages will improve the operating ease and prolong the on-the-job life of your product.



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Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

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Heavy Duty
Spring Loaded

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Over Center

Power
Take-Offs

Speed
Reducers

These engine users profit from Allis-Chalmers economy of operation...

"Performing perfectly . . . no maintenance"

This 3-*yd* shovel, powered by an Allis-Chalmers supercharged diesel with torque converter, is working in tough digging, removing shot rock on an interstate highway. The engine uses only 10 gal. of fuel per hour, "is performing perfectly . . . no maintenance of any kind has been required," says the owner.



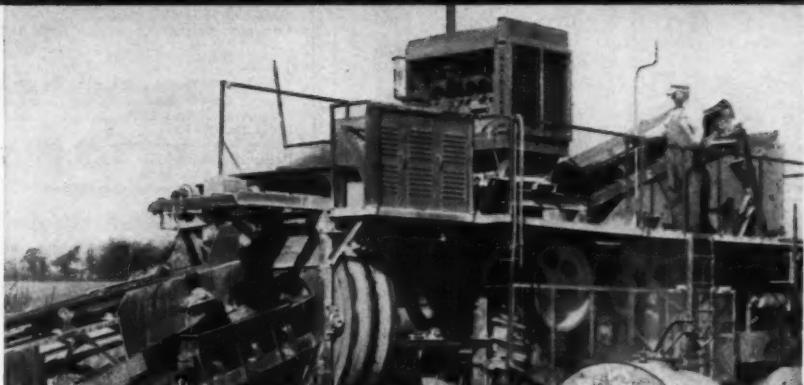
Helps hold down cost of moving overburden

Performance of big, tough, Allis-Chalmers supercharged diesels in these 55-ton trucks, has helped hold hauling costs down to a surprisingly low level.



"Like it best of any engine we've had"

"Wish we had one on the shovel," says the job superintendent about the Allis-Chalmers 180-hp diesel powering this crusher. The owner of another of these engines reports, "It's the cheapest of all to operate!"



...you can, too!

Allis-Chalmers engines give you maximum work per operating dollar. Design simplicity means easier

servicing, too. Allis-Chalmers engines are always on the job because you are close to fast parts and service, wherever you are. See your dealer for full information on these engines that save you money — up to 516 hp — any application. Allis-Chalmers, Milwaukee 1, Wisconsin.

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POWER FOR A GROWING WORLD



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SIZES AND MODELS FOR EVERY PORTABLE, STANDBY, CONTINUOUS USE FROM 350 WATTS TO 125 KW.

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Skywalk Supers

Workmen at Glen Canyon Dam watch from a footbridge 700 ft above the Colorado River while a blasting crew sets off a charge. The shot is part of the work of notching keyways into the sides of the steep cliff to serve as anchors for the 1,500-ft dam.

The view is fine, but it's a long walk to work. The high footbridge is the only access from one side of the 1,200-ft-wide canyon to the other until a permanent arch bridge is completed this month. Merritt-Chapman & Scott Corp., general contractor for the \$108-million Bureau of Reclamation project, set up three cableways to haul materials and equipment across the gorge and lower them to the bottom.

Contract period for the big dam is nearly seven years. Progress so far is good. The diversion tunnels have been completed and lined, and diversion of the river is expected early this year. Soon afterward, M-C&S will begin placing concrete in the dam.

A Pair of Record Jobs

Work has started on two-record-breaking projects in Europe:

- The Soviet Union is erecting what will be the world's tallest man-made structure. It's a reinforced concrete tower in Moscow that will stand almost 200 ft higher than New York's Empire State Building.
- France and Italy are driving the world's longest highway tunnel, a seven-mile bore through the heart of the Alps.

The Moscow skyscraper will serve as an office building and as a television and observation tower. The first nine stories will house a new Moscow TV Center. In the upper section, there will be several observation platforms, a 240-seat restaurant, and a TV transmission installation.

The tower will rest on a base 213 ft in dia. At the top it will be only 23 ft in dia. Walls will be 9.8 in. thick all the way up. Moscow's tower will stand 1,667 ft high compared with the 1,472-ft height of the Empire State Building.

The Alps tunnel will run between Entreves, Italy, and Chamonix, France, through the heart of Mont Blanc, Europe's highest mountain.

It will provide the first year-around road link through the Alps between France and Italy. Existing roads normally are open only about half the year.

About four miles of the tunnel will be driven from the Italian end; the other three miles from France. The French and Italian contractors will meet near the center of the mountain under about 8,200 ft of granite. Excavated tunnel section will be 775 sq ft; finished section, 678 sq ft. It is scheduled for completion in 1961. Cost is estimated at more than \$32.5 million.

Longest Suspension Span

A U. S. construction project of record size got final approval last month. It's the \$320-million Narrows Bridge between Brooklyn and Staten Island in New York harbor.

The 12-lane, double-deck bridge will have a center suspension span 4,260 ft long, 60 ft longer than the center span of the Golden Gate Bridge in San Francisco, now the world's largest suspension span. Side spans of the new bridge will be 1,215 ft long, and overall length will be 2½ miles.

The bridge's twin towers will rise 700 ft above the water to allow a vertical clearance over the channel at the middle of the suspension span of 228 ft.

The Port of New York Authority will finance and construct the bridge, then lease it to the Triborough Bridge and Tunnel Authority. Plans call for engineering design to be finished by next summer. Target date for completion of the project is mid-1964.

Yards or Pounds?

The practice of rating the capacity of earthmovers in cubic yards draws fire from R. G. LeTourneau, who says the ratings should be stated in pounds.

"Your machine doesn't give a hoot how many cubic yards you put on so long as you don't put on too many pounds," LeTourneau says.

"The tires won't burst, the steel won't fatigue, and the engine won't wear any faster hauling the load so long as you don't put on too many pounds."

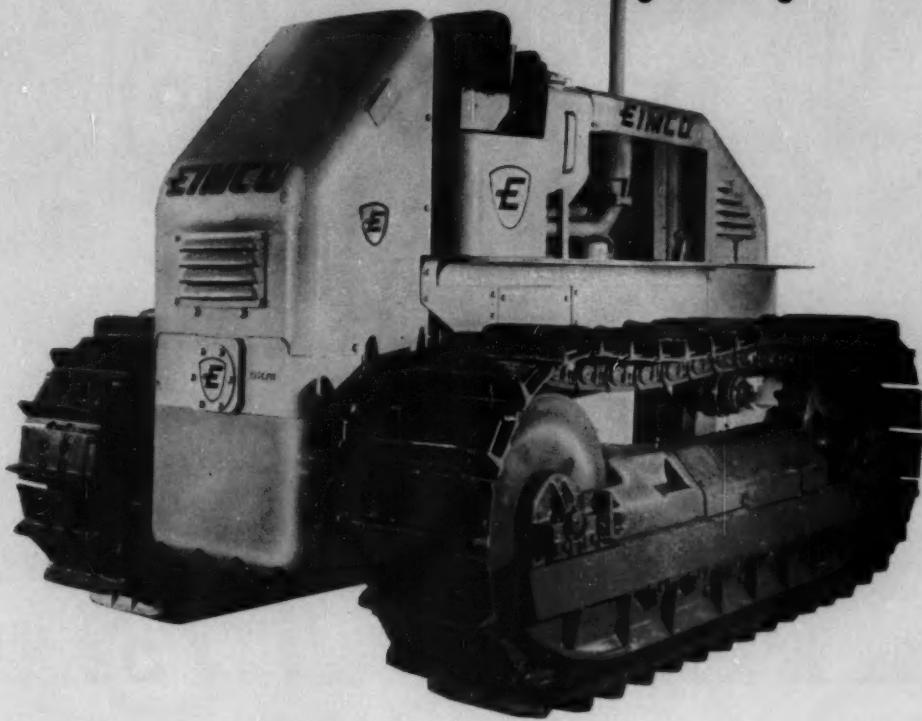
"So I say why be ambiguous in stating the capacity of a machine . . . when you could just as well say it in pounds, then roll it on a scale and check it."

"I realize that most of the time on a dirt job you are getting paid by the yard, but the rig doesn't give a hang about the cubic yards; it's the pounds that break her back and wear out the transmission, tires, and brake linings."

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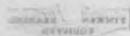


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